AMERICAN

RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, *Editor.*

ASSISTANT EDITORS:

JAMES T. HODGE, *For Mining and Metallurgy.*
CHARLES T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, *For Civil Engineering.*

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Room 12, Third Floor,

No. 136 Nassau Street.

IRON BRIDGES, BRIDGE & ROOF BOLTS, etc. STARKS & PRUYN, of Albany, New York, having at great expense establishe. a manufactory with every facility of Machinery for Manufacturing Iron Bridges, Bridge and Roof Bolts, together with all kinds of the larger sizes of Screw Bolts, Iron Railings, Steam Boilers, and every description of Wrought Iron Work, are prepared to furnish to order, on the shortest notice, any of the above branches, of the very best of American Refined Iron, and at the lowest rates.

During the past year, S. & P. have furnished several Iron Bridges for the Erie Canal, Albany Basin, etc. —and a large amount of Railroad Bridge Bolts, all of which have given the most perfect satisfaction.

They are permitted to refer to the following gentlemen:

Charles Cook, Nelson J. Beach, Jacob Hinds,	Canal Commissioners of the State of New York.
Willard Smith, Esq.,	Engineer of the Bridges for the Albany Basin.
Messrs. Stone & Harris,	Railroad Bridge Builders, Springfield, Mass.
Mr. Wm. Howe,	Engineer & Bridge Builder, Utica, N. Y.
Mr. S. Whipple,	

January 1, 1849.

TO RAILROAD COMPANIES AND BUILDERS OF MARINE AND LOCOMOTIVE ENGINES AND BOILERS.

PASCAL IRON WORKS.

WELDED WROUGHT IRON TUBES

From 4 inches to ¼ in calibre and 2 to 12 feet long, capable of sustaining pressure from 400 to 2500 lbs. per square inch, with Stop Cocks, T's, L's, and other fixtures to suit, fitting together, with screw joints, suitable for STEAM, WATER, GAS, and for LOCOMOTIVE and other STEAM BOILER Flues.

Manufactured and for sale by

MORRIS, TASKER & MORRIS.

Warehouse S. E. Corner of Third & Walnut Streets,

PHILADELPHIA.

To Railroad Companies, etc.

The undersigned has at last succeeded in constructing and securing by letters patent, a Spring Pad-lock which is secure, and cannot be knocked open with a stick, like other spring locks, and therefore particularly useful for locking Cars, and Swiiches, etc.

Companies that are in want of a good Pad-lock, can have open samples sent them that they may examine and judge for themselves, by sending their address to C. LIEBRICH,

46 South 8th St., Philadelphia.

November 3, 1849. 6m*

Patents for Inventions.

THE Subscriber offers his services for the procuration of Patents in the UNITED STATES; in the CANADAS and other British Colonial possessions; in the SPANISH, FRENCH and other WEST INDIES.

ALSO IN EUROPE.

ENGLAND WITH COLONIES; SCOTLAND and IRELAND. FRANCE, BELGIUM HOLLAND, etc.

☞ The foreign patents are procured through special agents, established by, and solely responsible to this establishment. At this office may be obtained all documents required in patent business; *Deeds, Conveyances, Agreements, Assignments*, etc. Counsel given on questions involving points of law in Contested Cases, and written opinions, on the title claims, etc., where the validity of a Patent is questioned.

MECHANICAL ENGINEERING DEPARTMENT.

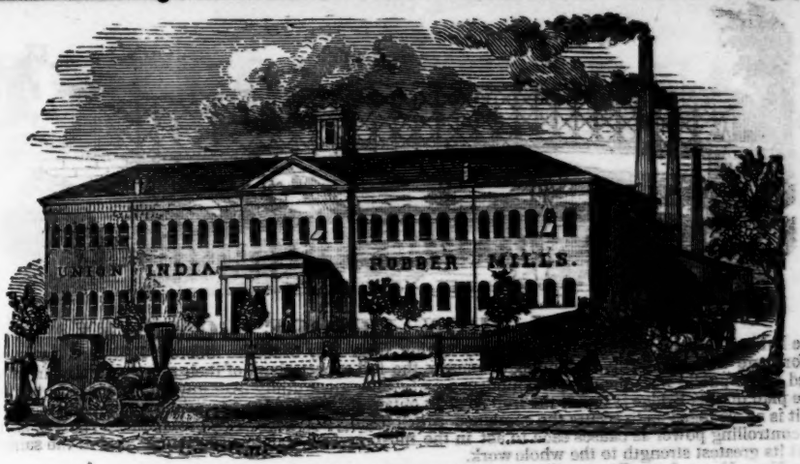
Drawings of all kinds furnished to parties who wish to prosecute their own patent business. Accurate working drawings for Pattern Makers or for making Contracts with Manufacturers; calculations and drawings made, for constructing difficult and complicated machines or parts of machines. Draughtsmen furnished to take Drawings of Mills, Mill Sites, and Machinery, in any part of the country.

Pamphlets, containing full information on the above subjects, furnished gratis.

JOSEPH P. PIRSSON, Civil Engineer,

Offic, No. 5 Wall St.

☞ HEAD QUARTERS FOR RUBBER GOODS. ☜



The Union India Rubber Company,

MANUFACTURERS AND DEALERS IN EVERY VARIETY OF

GOODYEAR'S PATENT METALLIC RUBBER FABRICS,

Which they offer on the most liberal terms at their Warehouse,

NO. 19 NASSAU STREET, NEW YORK.

Articles which this Company has the exclusive right to make comprise in part

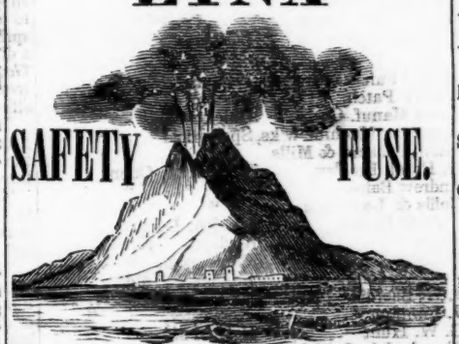
Beds,	Overcoats,	Life Preservers,	Mail Bags,	Camp Blankets,
Pillows,	Leggins,	Boat Floats,	Breast Pumps,	Travelling Bags,
Cushions,	Syringes,	Souwesters,	Saddle Bags,	Wading Boots,
Caps,	Canteens,	Gun Cases,	Clothing of all kinds,	Horse Covers,
Tents,	Buoys,	Portable Boats,	Carriage Cloth, assor.	Piano Forte Covers,
Bottles,	Maps,	Horse Fenders,	Hospital Sheeting,	Railroad Gum,
Tubs,	Sheet Gum,	Water Tanks,	Mattrass Covers,	Hose, all kinds,
Caps,	Tarpaulins,	Army Goods,	Bathing Caps,	Shower Baths,
Pants,	Life Jackets,	Navy Goods,	Baptismal Pants,	Chest Expanders.

Together with *all new applications of the Patent Rubber*, which with Boots and Shoes, Packing, Machine Belting, Suspenders, Gloves and Mittins, Tobacco Wallets, Balls, Baby Jumpers, Elastic Bands, etc., etc., will be sold to the Trade at Factory prices.

*** All orders for special articles to be manufactured, should be accopanied with full descriptions and drawings.

October 20, 1849.

ETNA



SAFETY FUSE.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

☞ *Sole Manufacturers*, ☜

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

☞ The Premium of the AMERICAN INSTITUTE was awarded to the *Etna Safety Fuse* at the late Fair held in this city.

November 3, 1849. 1y

RAILROAD India-rubber Springs.

IF any Railroad Company or other party desires it, the NEW ENGLAND CAR COMPANY will furnish India-rubber Car Springs made in the form of washers, with metalic plates interposed between the layers, or in any other form in which they can be made; in all cases guaranteeing the right to use the same against any and all other pretended rights or claims whatsoever.

F. M. Ray, 98 Broadway, New York.

E. CRANE, 99 State Street, Boston.

May 24, 1849.

DEAN, PACKARD & MILLS,

MANUFACTURERS OF ALL KINDS OF

RAILROAD CARS,

SUCH AS

PASSENGER, FREIGHT AND CRANK CARS,

— ALSO —

SNOW PLOUGHS AND ENGINE TENDERS OF VARIOUS KINDS.

CAR WHEELS and AXLES fitted and furnished at short notice; also, STEEL SPRINGS of various kinds; and

SHAFTING FOR FACTORIES.

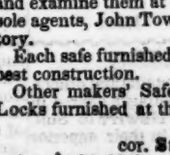
☞ *The above may be had at order at our Car Factory*,

REUEL DEAN, ELIJAH PACKARD, ISAAC MILLS, } SPRINGFIELD, MASS.

1y48

Iron Safes.

FIRE and Thief-proof Iron Safes, for Merchants, Banks and Jewelers use. The subscriber manufactures and has constantly on hand, a large assortment of Iron Safes, of the most approved construction, which he offers at much lower rates than any other manufacturer. These Safes are made of the strongest materials, in the best manner, and warranted entirely fire proof and free from dampness. Western merchants and the public generally are invited to call and examine them at the store of E. Corning & Co., sole agents, John Townsend, Esq., or at the manufactory.



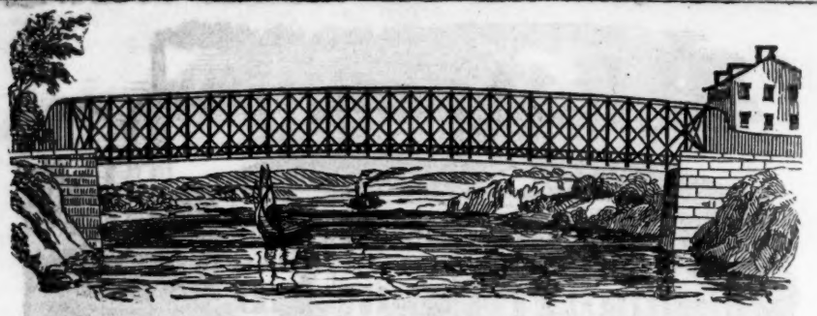
Each safe furnished with a thief-detector lock, of the best construction.

Other makers' Safes repaired, and new Keys and Locks furnished at the shortest notice.

H. W. COVERT,

cor. Steuben and Water sts. Albany.

August 24, 1849.



NEW YORK IRON BRIDGE COMPANY.

The Bridges manufactured by this Company having been fully tested on different Railroads, by constant use for more than two years, and found to answer the full expectations of their most sanguine friends, are offered to the public with the utmost confidence as to their great utility over any other Bridge now known.

The plan of this Bridge is to use the iron so as to obtain its greatest longitudinal strength, and at the same time it is so arranged as to secure the combined principles of the *Arch, Suspension and Triangle*, all under such controlling power as causes each to act in the most perfect and secure manner, and at the same time impart its greatest strength to the whole work.

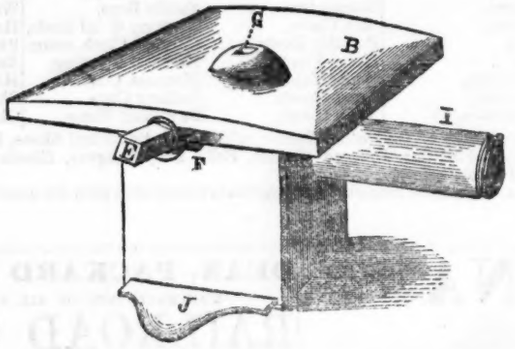
THE NEW YORK IRON BRIDGE COMPANY are prepared to furnish large quantities of Iron Bridging for Railroad or other purposes, at short notice, and at moderate prices.

Models, and pamphlets giving full descriptions of the above BRIDGE, with certificates based on actual trial from undoubted sources, will be found at the office of the Company, 39 Jauncey Court, Wall st., or of W. RIDER & BROTHERS, 19 *Nassau Street*, where terms of contract will be made known, and where orders are solicited.

M. M. WHITE,
Agent for the Company.

August 29, 1849.

E. Harris' Patent Rotary Blacksmith Tuyere.



LETTERS Patent were issued January 9, 1849, to E. HARRIS, of Springfield, for an Improved Rotary Blacksmith Tuyere. Since that time there have been some hundreds put in operation, giving satisfaction and full proof of superiority over all others.

This Tuyere is so arranged that by one movement it can be changed from the largest work to the smallest; at the same time the fire is changed in proportion, thereby making a great saving in coal. Words cannot convey the full merits of this Tuyere; nor is it deemed necessary to speak in disparagement of other Tuyeres, as every smith is capable of judging for himself, and will give merit where merit is due.

I will simply say that there has not been a single instance where I have had my Tuyere put in use but it has given full satisfaction, and is recommended by all who have used them, as being superior to any other ever introduced. I would invite all to give them a trial; and the names of those using them being given, I hope it may induce others to try them, as they recommend themselves.

Western Railroad Shop,	Springfield,	Mass.
" "	Pittsfield,	"
Connecticut val.	Springfield	"
" "	N. Hampton	"
Hartford "	Hartford,	Conn.
New Haven "	New Haven	"
Norwich and Worcester,	Norwich	"
N. York and N. Haven,	New Haven	"
Saratoga and Whitehall,	Saratoga,	N. Y.
Vermont Central,		
Hudson and Berkshire,	Hudson,	
L. Kingsley,	Canton,	Mass.
Hadley Falls Co.	Ireland,	W. Springfield, Mass.
Sidney Patch,	Boston,	"
Ames Manuf. Cor.,	Chickopee,	"
American Machine w'ks,	Springfield	"
Dean, Packard & Mills	"	"
G. Frank Bradley,	N. Haven,	Conn.
Andrew Baird,	"	"
Collis & Lawrence	"	"
Slate & Brown,	Windsor Locks,	
Gage,	Nashua,	N. H.
Machine shop,	Manchester,	"
Louis F. Lanney,	Baltimore,	Md.
J. H. Baerdid,	179 Chambers st.	N. Y.
J. Fanning	Rochester,	"
G. W. Hunt	41 Gold st.	"
Chamberlain & Waldo,		"
P. S. Burges, carriage maker,		"
Samuel Miller,		"
J. Leggett,	Steverson falls,	"
J. E. Harris,	Hillsdale,	"
John L. Graham,	Albany,	"
David Dalsell,	South Egremont,	Mass.
Roys & Wilcock,	Berlin,	Conn.

Agents for the sale of Tuyeres:
B. B. Stevens in New York and Connecticut.
W. S. Seymour in Massachusetts and R. Island.
A. J. VanAllen has the Agency for the Western and Southern States, and is now travelling through those States. Any communication addressed to the patentee will receive prompt attention.

E. HARRIS, Patentee,
Springfield, Mass.

November 23, 1849.

CHRONOMETERS.

MERCHANTS, Ship Owners, Captains and others, are invited to examine the advantages offered in the purchase of Chronometers, by HEWITT & SON, Makers, 92 Wall Street, (up stairs,) in their superior quality and great reduction of price.

H. & S. have for many years been engaged in the manufacture of Chronometers, for the first houses in the trad and also, for the Navy of most Nations, and have received numerous rewards for their superior performance. Their Chronometers may be obtained from the Observatory at Liverpool, by order from H. & S., and at City Road, London. They are warranted to give satisfaction; but if not approved of, will be exchanged in New York, London, or Liverpool.

Rating, Cleaning and Repairs, at *low charges*.

The Trade supplyed on the most liberal terms.

November 17, 1849.

F. M. Ray's Patent India-rubber Car Springs.

India-rubber Springs for Railroad Cars were first introduced into use, about two years since, by the inventor. The New England Car Company, now possesses the exclusive right to use, and apply them for this purpose in the United States. It is the only concern that has tested their value by actual experiment, and in all arguments in favor of them, drawn from experience of their use, are in those cases where they have been furnished by this company. It has furnished every spring in use upon the Boston and Worcester road, and, in fact, it has furnished all the springs ever used in this country, with one or two exceptions, where they have been furnished in violation of the rights of this company; and those using them have been legally proceeded against for their use, *as will invariably be done in every case of such violation.*

The Spring formed by alternate layers of India-rubber discs and metal plates, which Mr. Fuller claims to be his invention, was invented by Mr. Ray in 1844.—In proof of which we give the deposition of Osgood Bradley, of the firm of Bradley & Rice, of Worcester, Mass., car manufacturers, and men of the highest respectability. In this deposition, in relation to the right of parties to use these springs, he says:

"I have known Mr. Ray since 1835. In the last of May or the commencement of June, 1844, he was at my establishment, making draft of car trucks. He staid there until about the first of July, and left and went to New York. Was gone some 8 or 10 days, and returned to Worcester. He then on his retnrn said he had a spring that would put iron and steel springs into the shade. Said he would show it to me in a day or two. He showed it to me some two or three days afterwards. It was a block of wood with a hole in it. In the hole he had three pieces of India-rubber, with iron washers between them, such as are used under the nuts of cars. Those were put on to a spindle running through them, which worked in the hole. The model now exhibited is similar to the one shown him by Ray. After the model had been put into a vice, witness said that he might as well make a spring of putty. Ray then said that he meant to use a different kind of rubber, and referred to the use of *Goodyear's Metallic Rubber*, and that a good spring would grow out of it." There are many other depositions to the same effect.

The history of the invention of these springs, together with these depositions, proving the priority of the invention of Mr. Ray, will be furnished to all interested at their office in New York.

This company is not confined to any particular form in the manufacture of their springs. They have applied them in various ways, and they warrant all they sell.

The above cut represents precisely the manner in which the springs were applied to the cars on the Boston and Worcester road, of which Mr. Hale, President of this road speaks, and to which Mr. Knevitt refers in his advertisement. Mr. Hale immediately corrected his mistake in the article quoted by Mr. Knevitt, as will be seen by the following from his paper of June 8, 1848. He says:

INDIA-RUBBER SPRINGS FOR RAILROAD CARS.—"In our paper yesterday, we called attention to what promises to be a very useful invention, consisting of the application of a manufacture of India-rubber to the construction of springs for railroad cars. Our object was to aid in making known to the public, what appeared to us the valuable properties of the invention, as they had been exhibited on trial, on one of the passenger cars of the Boston and Worcester railroad. As to the origin of the invention we had no particular knowledge, but we had been informed that it was the same which had been introduced in England, and which had been subsequently patented in this country; and, we were led to suppose that the manufacturers who have so successfully applied this material, in the case to which we referred had become possessed of the right to use that patent. It will be seen from the following communication, addressed to us by a member of the company, by which the Worcester railroad was supplied with the article upon which our remarks were based, that we were in an error, and that the springs here introduced are an American invention, as well as an American manufacture. How far the English invention may differ from it we have had no opportunity of judging."

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HENRY V. POOR, Editor.

ESTABLISHED 1831.

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SECOND QUARTO SERIES, VOL. VI., No. 3.] SATURDAY, JANUARY 19, 1850. [WHOLE No. 708, VOL. XXIII.

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

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M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, January 19, 1850.

Lead Ores.

Processes for Separating the Silver from Argentiferous Leads.—Though we have not yet had occasion to adopt these processes in this country, it seems reasonable to suppose we shall some time require them, considering the great variety of our mineral resources already known, and the numerous localities, which have afforded more or less argentiferous galena. A short account of them therefore will not be inappropriate in a description of these ores.

The only process in use until within a few years in Germany and in England, is that of *cupellation* based upon the property of lead to suffer oxidation, while silver is unaffected by a current of air playing over the surface of a melted body of these two metals. In Germany a circular furnace is built, its floor about six feet in diameter, and covered with a layer of washed wood ashes carefully rammed; in its centre a cavity is left intended to collect the silver from the charge of silver-lead. On this floor is placed the charge of silver metal, amounting to 84 cwts. The fire place is separated from the body of the furnace by a bridge, as in a reverberatory furnace. It is fed with billets of wood of a resinous nature, that gives a quick flame. At the side of the furnace are placed bellows for blowing a current of air over the surface of the melted metals, the tweres entering just above its level.—Opposite the tweres is an aperture for the exit of the oxide of lead formed in the process.

The heat is gradually raised for about three hours, until the lead is thoroughly melted, when the bellows commence to blow over its surface. In about five hours the fire is still more increased, and the froth of oxidated metals is draw with a rake out of the aperture at the side of the furnace: this operation continues an hour and a half. The litharge or oxide of lead then begins to form, a part sinking into the ash floor and a part floating towards the aperture, out of which it drops in a liquid form.—For twelve hours this operation goes on, the metal on the floor, as it diminishes in quantity constantly growing richer in silver. The fire is then still more increased, and precautions are taken to prevent the escape of silver through the aperture in case of an explosion, or sudden sinking of the silver cake into the ash floor. After about twenty hours the remaining metal suddenly brightens up, the process having reached the "*lightning*" which attends the disappearance of the last particles of the oxide of lead. Hot water is then introduced upon the cake of silver, and the fire is suffered to go down.

The process requires about twenty hours and a consumption of about 800 feet of resinous wood to 100 cwt. of lead. Larger furnaces and larger charges than 84 cwt. have failed of working successfully.

The litharge taken out of the aperture and that from the ash floor of the furnace is afterwards reduced to a metallic state in another furnace with charcoal; but there is always a loss from the original quantity of the metal of from four to seven per cent.

The English refining furnaces differ from the German in using a much smaller ash floor or cupel, and introducing the lead into it in a melted state in portions as the lead is oxidised and the litharge removed. The cupel is made in a moveable iron frame, which when filled with a mixture of fern and bone ashes is set in the floor of the furnace. The charge run through in one turn is the same quantity, 84 cwts., as in the German furnaces, and occupies from 16 to 18 hours. The metals are not wholly separated, but about one cwt. of lead is left with the silver until the mass is taken out and submitted to another cupellation on a smaller scale.

Sometimes cupels are used sufficient for the refining of three times the quantity of lead, the litharge then being taken out by different apertures.—By the former method three men can cupel 24 *fodders** of lead in a week with a consumption of 3 cwt. of bituminous coal for each fodder. By the latter, when 12 or 13 fodders are passed through one cupel, only one cupel is made per week; but three men can still refine 24 to 26 fodders in this time conducting at the same time two furnaces.

This process is too expensive for ores containing a small amount of silver. It has beside the objection of involving a considerable loss of lead and the trouble of re-converting the litharge to the metallic state, there being no sale for the large quantities made in this operation. It is also highly injurious to the health of the workmen.

A new method was introduced a few years since by Mr. Pattinson of Newcastle, founded on the tendency of lead and silver to separate while slowly cooling from a melting temperature. In this condition the lead tends to form little crystals, which subside in the fluid, as crystals of salt do in an evaporating briny solution. Both may be removed, leaving the remaining portion of it richer in the other substances they contained. A considerable quantity of crystals of lead may be thus removed without risk of taking out any of the silver, but as the mixture becomes richer in the precious metal, a portion of this will be found in the lead crystals.—As the process is conducted the alloy is usually brought to about ten times its original richness in silver, which leaves only one-tenth to be finished by the old process of cupellation, the remaining nine-tenths having been taken out and re-melted into marketable lead without the trouble, loss in lead, and expense of the litharge process.

The silver lead is melted in iron kettles capable of holding each about three tons of lead. Several of these are set in a line, and each has a discharge pipe from the side at the bottom, by which the re-

* A fodder is 21 cwt.

maining portion may be drawn off at will. Each kettle has its own fire, and this is shut off from the first one, as soon as the lead it contains is melted. To keep up a uniform temperature this is constantly stirred with an iron bar; and when the crystals are seen to form, another workman with a long-handled iron drainer, previously heated, *fishes* them out, and after letting the liquid metal drain from them, throws them into the next kettle. The first workman continues to stir and keep the sides clear of the cooling portions, which collect upon them, while the other takes out the crystals, until only one-fourth part of the whole remains. This occupies about 15 minutes. Half of the remainder is then taken out as it crystallises and thrown upon the ground. The kettle is then re-heated and the rich alloy is run off, when the crystals last taken out are returned to it and fresh lead added to recommence the operation.

While this is melting the same process is carried on in the second kettle. Three quarters of its contents are removed in a crystalline state into the third kettle, one-eighth in crystals which are thrown on the ground, and the remaining eighth back into the first kettle. The third and fourth kettles are treated in the same way, and in the fifth the lead is finally melted to be run off into pigs.

Samples of the product of this process taken from the different stages were analysed at the School of Mines of Paris, and gave the following results.—They were of two different operations one with lead, nearly ten times as rich in silver as the other.

1.

		Silver in 1 of lead.
0.	Original lead	0·001153
	Rich crystals	0·003324
2.	Poor "	0·000933
	Rich " From the poor crystals of No. 2	0·0020892
3.	Poor "	0·0007021
4.	Rich " From the poor crystals of No. 3	0·001399
	Poor "	0·0004569
	Rich " From the same of No. 4	0·0098135
p.	Poor "	0·0001128

2.

		Silver in 1 of lead.
0.	Original lead	0·000224
	Rich crystals	0·000598
2.	Poor "	0·0000877
	Rich " Coming from No. 2	0·0002367
3.	Poor "	0·0000292
	Rich " Coming from No. 3	0·0001300
p.	Poor "	0·0000195

From these tables it is seen, that with the richer lead *four* crystallizations were necessary to render the last product ten times as rich in silver as the original lead; while with the poorer quality only *three* crystallizations were required to produce the same result.

Examining, besides, in the 1st table, the proportions between the richness of each poor lead and the lead from which it directly comes, we find these represented by the following numbers, which go on regularly increasing as the alloy becomes poorer in silver, viz: 1·15, 1·32, 1·53, 4·05.

Whence it appears that the process is best adapted to the poorer qualities of silver lead.

An operation conducted upon 25 fodders, 15 cwt., 49 lbs., or 540 cwt. 49 lbs. of metal having 5 ozs. of silver per fodder, gave, after three successive crystallizations, the following products, with the accompanying expenses.

440 cwt. of poor lead containing ½ oz. of silver per fodder.

15 " 49 lbs. of lead having nearly the original richness.

84 cwt. of rich lead for cupelling having 29 ozs. per fodder.

Loss 1 cwt.

The expenses were as follows:

Refining by Crystallization.

274 days' work at 3 shillings each	£4	2	6
3 cwt. of coal per fodder of poor lead separated	0	12	0
£3 per fodder of poor lead for patent rights	3	3	0
Loss—1 cwt. lead (rate of 25 lbs per fodder)	1	4	0
	£9	1	6

Cupellation of the 84 cwt.

Labor	£0	14	0
Fuel, 12 cwt. per fodder of lead	0	8	8
Cupel	0	6	4
Loss in lead, 1-14 of the lead cupelled	7	3	0
	£8	12	0

This makes the whole expenses by the new process £17 13 6, while by direct cupellation it would have been £54 16 7. According to this estimate, the saving with lead of this richness by the new process over the old is as three to one; but as seen from the analyses of the products of the different qualities of lead operated upon, the expenses must increase with its richness in silver. The cupelling process on the other hand is not liable to this objection, and is moreover applicable to impure qualities of lead, that would be altogether unsuited to the parting by crystallization. Where the leads are rich in silver, and of impure quality, and there is a market for the litharge produced, the old method will be found best adapted for separating the two metals; but where the leads are of pure quality and contain a small quantity of silver, the crystallization will be the most economical process, and will pay even when the alloy contains only about *three* ounces of silver to the ton.*

SHAWANGUNK MINE—NEW YORK.

This is particularly described by Prof. Mather and Dr. Beck in the State Geological Reports.—The mine is in Sullivan county near the village of Wurtsboro', the smelting works on the Delaware and Hudson canal, and the mine itself not more than a mile distant. It is in a mountain six or seven hundred feet above the Mamakating valley. This mountain is composed of the rock called Shawangunk grit or conglomerate; one of the lower stratified rocks of the New York system. It corresponds to the coarse Sandstone Formation IV of the Pennsylvania and Virginia Reports. Dr. Beck describes the rock at the mine as dipping west south west about 45°. From Prof. Mather's report this appears to be rather the course of the strata, as the only dips he cites, on page 356, are either east south east or west north west. The course of the accompanying section, which is from Prof. Mather's Report, is not given. On the ground plan of the mine and adjoining lands surveyed by John Kitz, the Delaware and Hudson canal is seen to the south-east of the mountain. This appears then to be the direction of the dip. There seems to be some doubt whether the ore deposite is a bed or a vein. Prof. Mather describes it as occurring between the strata, its strike being the same, but the angle of its dip somewhat greater; and he expresses himself fully of the opinion that its coincidence with the stratification is to be regarded as accidental, and that it is a true vein. Veins which follow the strata, and then cut obliquely across them are common in all parts of the world; the veins in the metalliferous limestones of England are often of this character,

* Most of the above data were obtained from an article of M. Seutis, as quoted from, in the Voyage Metallurgique of M. M. Dufrenoy Elie de Beaumont, etc., to which the reader is referred for farther information.

A.—Sandberg Creek.
B.—Delaware and Hudson Canal.
C.—Limestone.
D.—Shawangunk Grit.
E.—Lead Mine.
F.—Shawangunk Mt.
G.—Hudson Slate.

and some interesting examples of the same have been cited at Saint Bel on the Rhone.* The vein-stone is a siliceous material resembling the walls; and the ores, which are blend galena, copper and iron pyrites, occur disseminated through it; crystallized quartz too is associated with them. The whole thickness of the vein varies from two to five feet, and the larger proportion of the contents is the quartose gangue. It is very subject to contractions and swellings, and to changes in the relative proportion of gangue and ore; of the different ores blende is the most abundant, and this with the galena constitutes nearly the whole of the metalliferous portion. Three large masses of pure galena have been found, weighing severally 800, 1000 and 1400 lbs. Two adit levels, seventy-five feet apart, have been driven into the vein, and are connected by an inclined shaft in the vein; several galleries too have been run on the vein; and these workings are at such a depth, that one hundred and fifty feet above were drained by them and ready to be removed at the time of Prof. Mather's visit. It appears then that the vein had been systematically and thoroughly opened. Prof. M. remarks that "*The advantages of these mines are,*

1. Contiguity to water transportation, and nearness of market.

2. Great depth to which they may be drained without machinery.

3. Abundance and cheapness of fuel for smelting.

The disadvantages are,

1. Uncertainty of the quantity of ore.

* Geologic Appliquee par A. Burat, p. 124.

2. The more or less intimate mixture of the galena and blende.

3. The siliceous nature of the gangue."

The blende, which is so abundant in the mine, is not only injurious by diminishing the quantity of galena; but on account of being so difficult to separate from it, in order that the lead ore may be obtained clean for smelting. The best contrivances for effecting this appear to have been employed, such as stamps or crushers, screens and shaking washing tables.

Many tons of lead have been made here of good quality—reduced in a reverberatory furnace situated on the banks of the canal. The lead is found to be slightly argentiferous, but the quantity of silver is too small to pay for separating.

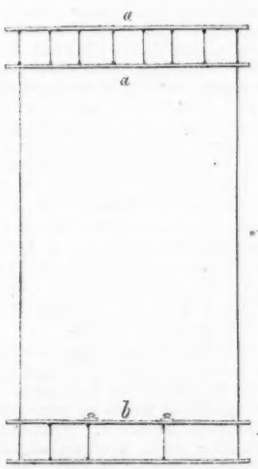
Since the date of these reports we have no farther accouuts of this vein, and it must soon after have been abandoned. Other veins are known on the Shawangunk range in Sullivan and Ulster counties; but they are less promising than the one described. H.

An Account of the Construction of the Britannia and Conway Tubular Bridges.

Continued from page 20.

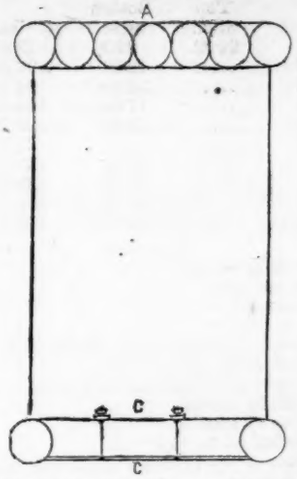
The defective powers of resistance of all the tubes of this shape have suggested a new arrangement and distribution of the metals; it being evident from the experiments that the tube will resolve itself into a huge hollow beam or girder, leaving the two resisting forces of compression and extension as wide apart as possible. It is further conclusive, that the sides must be made comparatively light, and considerable additional material introduced into the top and bottom of the tube. This will give greatly increased strength, and a few more experiments will determine which of the two shall have the preponderance. It is more than probable that the bridge, in its full size, may take something of the following sectional shape (fig. 9).

Fig. 9.



The parts *a*, *a*, being two longitudinal plates, divided by vertical plates so as to form squares, calculated to resist the crushing strain in the first instance, and the lower parts, *b*, *b*, also longitudinal plates, well connected with rivetted joints, and of considerable thickness to resist the tensile strain in the second; or it may resolve itself into something of this form (see fig. 10,) with a series of tubes extending the whole length of the upper side, to resist compression, and two tubes with strong longitudinal plates, *c*, *c*, to resist tenslon, and prevent tearing in that part—the sides in this case to be made light, in order simply to connect the upper and lower resisting portions of the structure. From the above statement you will perceive that we are still short of the correct form. The experiments are progressively developing facts which I have no doubt will enable me, with the assistance of such an able experimenter and excellent mathematician

Fig. 10.



as my friend Mr. Hodgkinson, to lay before you such results as will fully justify the adoption of this important structure. In the meanwhile I shall be glad to hear from you; and, requesting the favor of your opinion,

I am, etc., W. Fairbairn.

R. Stephenson, Esq., C. E.

—

"'I have written the word 'private' at the commencement of this letter, as it is merely written offhand, in order to put you in possession of the progress we are making in these researches, without being pledged to facts. I should think another week's investigation, which I expect will take place in a fortnight, will cnable me to speak more definitely.'

"The following letter from Mr. Hodgkinson explains his views repecting the experiments which had been made, and also gives his ideas as to the form of tubes and the experiments which he should recommend for trial. His suggestions were carried out, in accordance with the instructions sent to Millwall on October 2, but the experiments showed that the forms which he recommended were weak and unsatisfactory.

—

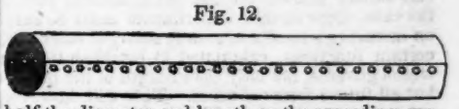
Abersychan, Sept. 26, 1845.

"'My Dear Sir: I have received your letter with the remainder of the experiments, but what to do with them I am quite at a loss. I have no principles to guide me, satisfactory to my own mind, nor the aid from books, which I should have if I was at home. I have done my best to reduce some of the experiments; but the results are so much at variance that I am completely puzzled. What adds greatly to the difficulty is, their want of adaptation to mathematical requirements. I shall not have it in my power to leave this place before the end of next week, without doing the parties a great injustice, but will do all I can on my return. I have been very unwell since my return from London, in consequence of the cold I caught there. I mentioned to you before, that there are fundamental experiments necessary to make any useful application of these of yours; but while I am here I can do nothing, and before I should be at liberty to do anything but try to reduce the experiments made and suggest some modifications of them, it would be necessary to get the sanction of Mr. Stevenson, I suppose. Were I at liberty to make any experiments, I would begin with some cylinders as free from rivets as possible near to the middle, so that they should break in a part not rivetted. This might be done by taking long plates for the middle of the cylinder, and lengthening it out by small plates, since the rivets in them would not signify. I would have three cylinders made, all of the same diameter and length, say 18 or 20 inches diameter at the least, and the length 16 or 17 times the diameter. One of these cylinders should have its plates half an inch thick, and the others one-fourth and one-eighth of an inch. I would have them simple cylinders with one row of rivets on each side—none at the bottom or top near the middle—nor any aperture made there for the shackle. A section of the cylinder would be as represented in fig. 11,

Fig. 11.

where I would rather there were no rivets: but, as they cannot be avoided, they must be introduced. The length of the cylinder will be as shown in fig. 12. I would have three other cylinders made, of

Fig. 12.



half the diameter and length as the preceding one; and their plates should be of half the thickness as those above, say one-fourth, one-eighth, one-sixteenth of an inch; these cylinders should be rivetted *on the side only*, as in the former case. If you think well to prepare these for me, I will make the experiments on my return to Manchester; and the results will throw a little light upon the subject and enable me to judge better of the anomalies in your tube experiments. There appears to me, however, to be a great want of fundamental information on the subject.

I am, etc., E. Hodgkinson.

W. Fairbairn, Esq.

—

"'P.S. I am much in want of a book, 'Navier's Application de Mecanique.' I have thought of sending home for it; but perhaps by the time it arrived I should be ready to return. I know there is something to my purpose in 'Navier.' You have the book likewise.'

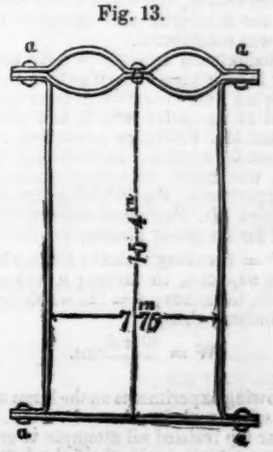
"Mr. Hodgkinson did not experiment upon these tubes although they were constructed for him, since he found, from the experiments which had already been recorded, that the rectangular forms were decidedly the best; accordingly the models subsequently made for him were of this form. The interval of time which ensued between the experiments on the rectangular and elliptical tubes with single cells, and those on the tube with a corrugated top, was chiefly occupied in preparing this latter tube for experiment. On the 14th of October it was subjected to the usual tests, as explained in the following letter addressed to Mr. Stephenson:

—

Manchester, Oct. 15, 1845.

My Dear Sir: Our experiments yesterday were the best and most satisfactory we have yet made; and, agreeably to expectation, the form, as per annexed sketch, gave not only the greatest strength,

Fig. 13.



but what was of equal importance, there was a near approximation to an equality of the forces on the top and bottom sides. The figure, you will observe, was in strict accordance with the views contained

in my letter, which followed our previous efforts; the section being a rectangular figure, as above, with a double corrugated plate, the plate for the bottom being 0·18 inch. The sides were only 0·07 in. thick, and the whole rivetted together, as at *a,a,a,a*. With this form of tube (19 feet distant between the supports) the deflections were carefully taken at intervals, from weights of about 1,000 lbs.; and before the tube gave way, which it did by tearing the sides from the top and bottom, it sustained for some minutes a weight of 22,469 lbs. From this last experiment it is evident we are approaching the strongest form; but we are still in want of further investigation, in order to obtain a correct and satisfactory formula for the reduction of the experiments. Some existing formulæ from 'Navier' and others can be applied, but they are not satisfactory; and before my friend Mr. Hodgkinson can satisfy himself on the mathematical part of the case, some further experiments must be made on *exceedingly small and greatly enlarged tubes*, with certain functions, calculated to establish the law which governs, not only the strength of the present but all future forms of tubes. This will, however, not create any delay, as I have ordered the plates, and I shall have the tube constructed forthwith, the experiments being made here in Manchester, on account of the more powerful apparatus which we have at command. In the meantime, I think we have sufficient data to guide you as to the security of such a structure; and provided you will fix time and place where we can meet, I shall lay before you such information as will, I trust, justify the measures you intend to adopt. Any day after next Tuesday I could meet you in London or elsewhere.

I am, etc., W. FAIRBAIRN.

R. Stephenson, Esq.'

—

"It is from this period, says Mr. Fairbairn, that I date the disappearance of almost every difficulty respecting the construction and ultimate formation of the Britannia and Conway tubes. The powerful resistance offered to compression by the cellular form of top, as exhibited in the last experiment, at once decided, in my mind, the form to be adopted in those for the large tubes, and from this time forward I had no doubts as to the practicability and complete success of the undertaking."

The great point, now, was to deduce a formula which could be applied to the designing of the large tubes, and the experiments of Mr. Eaton Hodgkinson were more particularly directed to that object. On February 9th, 1846, Mr. Stephenson presented his report to the Chester and Holyhead railway company, in conjunction with reports by Mr. Fairbairn and Mr. Hodgkinson. In this report Mr. Stephenson avoids committing himself to any definite opinion on the subject of the suspension chains —Mr. Hodgkinson recommends that suspension chains be employed as an auxiliary, as otherwise great thickness of metal would be required to produce adequate stiffness and strength. Mr. Fairbairn states that, "provided the parts are well proportioned, and the plates properly rivetted, you may strip off the chains, and leave it as a useful monument of the enterprise and energy of the age in which it was constructed.

Mr. Hodgkinson appears to have had so much difficulty in satisfying himself as to the proper form to be adopted, and the directors to have become so impatient at the delay which had already taken place, that Mr. Fairbairn proceeded to work the problem out for himself. A model one sixth of the real size, was made, with square cells, and, after several experiments, the following formula was deduced, which Mr. Fairbairn states to be that now employed for his patent girders.

Let W = breaking weight; l, the distance between the supports, in inches; a, the area of the bottom side, in inches; d = the whole depth of the beam in inches; then,

$$W = \frac{80\ a\ d}{l} \text{ tons.}$$

The following experiments on the large model tube one-sixth of the real size, shows how the strength of the cellular top resisted all attempts to crush it until the last trial, the strength of the bottom being increased at each trial. This tube was 78 feet long, and 75 feet between the supports; 4 feet 6 inches deep, and 2 feet 11 inches wide.

No. of experiments.	Thickness of plate in inches. Top area.	Bottom area.	Breaking weight. lbs.
1	24·02	8·80	79,278
2	.....	12·80	97,102
3	.....	12·80	126,128
4	.....	17·80	148,329
5	.....	22·45	129,009
6	.....	.....	26,781
7	.....	22·45	135,255
8	.....	22·45	135,255
9	.....	22·45	154,452
10	.....	22·45	192,895

REMARKS.

1. Broke by tension.
2. Twisted over.
3. By tension.
4. By tension,
5. Weight left suspended. Tube turned on its [side.
6. Experiment discontinued.
7. Weight left suspended for 9 days.
8. Broke by tension.
9. Broke by tension.
10. Crushed on the top.

The first of the Conway tubes was tested, and gave the following results: Rectangular tube, 412 feet long, 25 feet 6 inches deep in the middle, 15 ft. wide, and 400 feet between the supports. Area of the top, 670 inches, ditto of bottom, 517 inches.—Computed weight of tube, including rails and cast iron frames at the ends, 1300 tons.

No. of Exp.	Deflection. Inches.	Weight. Tons.
1	7·91	0
2	9·02	95
3	9·50	154
4	10·50	201
5	10·95	301

REMARKS.

The weight of the tube, 1300 tons, gave a deflection of nearly 8 inches, and 95 tons left in the inside of the tube for 4 hours increased the deflection from 9·02 to 9·25. This weight was continued for 17 hours, with an increase of deflection ·1 inch.

After this, 301 tons, exclusive of the weight of the tube, were laid on, when the experiment was discontinued. The first weight, 95 tons, was spread over a surface of 70 feet in length of the tube in the middle: the second weight was laid over a surface of 105 feet in the middle; the third over a surface of 150 feet in the middle: the last over a surface of 190 feet in the middle.

THE GOLD-BEARING QUARTZ OF CALIFORNIA.

Mr. Wright's Specimens and Investigations.

In our last publication, we alluded briefly to the interest which had been excited here by the exhibition of some fine specimens of gold bearing quartz, said to be found in inexhaustible masses or quarries, through the whole mountainous region which forms the western slope of the Sierra Nevada. We have since had an opportunity of examining these specimens, and of learning, more minutely, the character of the rock, the tests to which it had been subjected, and the results which it has given. We desire to avoid all exaggerated statement upon a subject in regard to which the attention of the world is already sufficiently awakened; yet we deem it not too much to say, that the facts thus indicated in regard to the character and structure of this vast mountain range, appear to us altogether to surpass, in importance, any previous discoveries in the gold region, which have yet been made public. We are glad to learn, that the whole subject will very soon be brought, in an authentic shape, to the attention of the public, in the form of a full and comprehensive report to the department of state at Washington, by the Hon. T. Butler King. As early as June last, Mr. King devoted two entire months to the laborious exploration of the whole region, and fully matured his conclusions in regard to it. His labors were interrupted by a severe, protracted illness, but his report will now soon be completed, and will doubtless, we trust, reach Washington before the discussions upon the California quesiion shall have come up in Congress.

We hazard nothing in saying that the facts and the views to be set forth in his report will command the public attention and interest to an extent almost, if not altogether, unexampled by any similar document. As Californians, we await its publication with impatience, Mr. King, we learn, will take to Washington with him, a full collection of specimens of the gold formations, both pure and in union with the quartz, which will fully illustrate and demonstrate, with almost mathematicrl clearness, his theory of the gold region of California.

The particular specimens which we have seen of these quartz mountain quarries, are in the possession of Mr. Wright, one of the members of Congress elect from California, who will take them on to Washington in the steamer of the 1st of December. They consist for the most part, of small pieces of quartz rock, generlly of a brownish tinge, and, in some instances, presenting the appearance of slight incipient decay, or decomposition of the rock formation. In all these specimens, the gold points, or particles, are very slightly, if at all, visible to the naked eye. The microscope, however, reveals the gold more clearly.

Besides these pieces which Mr. Wright has himself selected, with great care, as the fairest average samples of the general appearance of quartz, there is also one larger fragment of the same rock, weighing, we should suppose some ten or twelve pounds, from all parts of which the gold protrudes plainly, in a state almost pure. This single fragment of quartz, which Mr. Wright by no means regards as an average sample of the quarries, but which he pronounces to be the richest stocks pecimen he has seen, is found, by the most careful specific gravity test as applied to it by Mr. Wright, to contain pure gold to the amount of about six hundred dollars. This piece of rock, we understand from Mr. Wright, is destined to be laid (as a memorial from the California mountains, we suppose,) upon the table of the speaker of the house of representatives. Its appeal, we think will be heeded.

But the interest or importance attaching to this or to any other single and isolated fragment specimen, however peculiar and curious and rich in itself, is very slight and even inconsiderable, in comparison to that which belongs to the more numerous fragments of the quartz, in which very little gold, or none, can be discerned by the naked eye, and which have been cautiously selected by Mr. Wright on the spot, as the fairest average specimens of whole veins and quarries, and sweep visibly in sinuous and broken lines through the whole western slope of the Sierra Nevada, and to form vast masses of mountain rock, large enough and numerous enough to freight many times over all the navies and commercial marine of the world. Mr. Wright has spent, he informs us, much of the past season among the mountains collecting his samples of the quartz in different localities, and subjecting the yield of gold from them, in very many instances, to the most rigorous tests.

In all these experiments Mr. Wright has been guided by the skill and judgment of Mr. Augustus Lelind, a gentleman largely conversant with mining operations, and who has been from the first equally interested with Mr. Wright in all the researches which have been made.

The astonishing result brought out by these investigations is that in a particnlar and very extensive vein, four pounds of this rock yielded upon the average eleven dollars worth of pure gold, valued at sixteen dollars to the ounce. That is to say, the yield of gold from these average samples of the rock in this particular vein, is nearly three dollars for each pound of quartz. Mr. Wright exhibited to us two small masses of gold, each about the size and shape of a large musket ball, and both presenting the granulated appearance of gold extracted and collected by the aid of quicksilver. One of these contains about twelve dollars of pure gold, and is the largest yield which has been obtained from four pounds of the rock from the vein in question. The other contains about twelve dollars, and is the smallest yield which has been obtained from any of the experiments upon the rock of this vein. We understand that the tests applied have been sometimes the test of the comparative specific gravity of the pure quartz and the gold bearing quartz.

The samples of the rock which Mr. Wright has tested have been taken from many different veins. In no sample tested has the yield been less than one to the pound of quartz. The average yield of the different veins has been, as determined by the sam-

ples, from one dollar and a half to two dollars to the pound of rock.

A single fact will show the unheard of and astonishing character of the results which have been thus arrived at. Mr. Wright informs us that he has conversed with an intelligent gentleman, now in this country, who has been long conversant in the capacity of an overseer, with mining operations, as carried on in the quartz veins of Georgia. From this source, Mr. Wright learns that a fifteen horse team power, working twelve stamps, will stamp about a thousand bushels of quartz rock in a day—each bushel of quartz weighing about eighty pounds. If twenty-five cents worth of gold is yielded from each bushel of eighty pounds, the business is considered a good one in Georgia. If the yield be fifty cents to the bushel, the profit is large. Now the yield of the rock which Mr. Wright has collected and tested, instead of being a quarter of a dollar, or half a dollar to the seventy-five pounds, is, in one great vein, nearly three dollars to one pound. Abate this, in view of the possible or probable mistake, or in view of the superior yield of a single richer vein, to an average of two dollars, or of one dollar, or of half a dollar, to the pound, and the result still remains, in every point of view, almost equally unexampled and momentous.

The whole question is, does gold-bearing quartz, making any approximation to any such yield, exist in California, in vast and inexhaustible masses? On this main point the recent investigations of Mr. Wright coincide entirely with the observations and conclusions of Mr. King, and with the testimony of all the explorers of the region with whom we have conversed. They all agree that a large number of veins of quartz permeate visibly the western slope of the Sierra Nevada running mainly from north to south, and throwing out branches from the main lines, at intervals in every form, and in all directions. Mr. Wright, we learn, is so well assured of the reality of the results at which he has arrived, that, in connection with his partners, he has already, at a large expense placed a number of men at work on one of the localities which he has observed, and which he states to be, apparently, scarcely more promising than many others—has sent for a mule of quartz rock, to take with him to Washington, across the Isthmus—and has already forwarded to the Atlantic side a large order for machinery suitable for the mining operations which he contemplates.—*Pacific News, Nov.* 30.

From the Miners' Journal.

The Anthracite Coal Trade.

The last number of the Miners' Journal publishes its annual official tables of the coal trade, from which we ascertain the quantity of anthracite coal sent to market from the different regions in 1849 and also 1848, to be as follows:

Schuylkill.	1848.	1849.	In. & Dec.
Railroad....	1,216,233	1,115 918 dec.	100 315
Canal.....	436,602	489,208 in.	52,606
Pinegrove...	61,530	78,299 do.	16,769
	1,714,365	1,683,425 dec.	30,940
Lehigh	680,746	801,246 in.	120 500
Lac'wana...	437,500	454,240 do.	16,740
W.lk'barre..	237,271	559,080 do.	21,809
Shamokin ...	19,365	19,650 do.	294
		25,000	
	3,089,238	3,242,641	
		3,089,238	

Increase from all the regions, 1849..... 153,403 tons.

Of the quantity sent to market
Schuylkill county furnished.... 1,683,425 tons.
All other regions..... 1,559,216 "

Excess in favor of the Schuylkill region..... 123,209 tons.

Of the quantity of coal sent to market since the commencement of the trade, Schuylkill county has furnished.....13,760,575 tons.
All other regions.....11,363,206 "

Total quanty..... .....25,123,379 tons.

Lehigh Coal Trade.—The Lehigh region sent to market during the year 1849,801,246 tons, against 680,746 in 1848—being an increase of 120,500 tons during the past year.

Coal Trade of the Line.—The quantity of coal delivered on the line between the coal regions and the permanent bridge,
during 1849, was by railroad.....145,582
do. do. canal..... 83,708

Tons.....239,290

In 1848 the railroad delivered 182,312, and the canal 70,525—in all, 252,837 tons. Decrease, in 1849, 13,549 tons.

The stoppage of iron works and factories on the line, during the portion of the season, was the cause of the decrease in consumption on the line.

Tonnage of Boats on the Canal.—We give below the average quantities carried by boats on the canal, and also the maximum load from the different shipping points in this region, except Port Clinton, which we could not obtain in time:

	Average load. Tons.	Maximum load. Tons.
Port Carbon.....108		187
Mount Carbon.....137		177
Schuylkill Haven....106		182

When the canal was first completed in 1825, the boats carried from 15 to 20 tons—25 tons was considered a large cargo of coal. It is believed that boats may be constructed to carry a cargo of 200 tons on the Schuylkill canal. It is now one of the most noble improvements of the kind in the country, and we feel confident, that the day is not far distant when the stockholders will be properly rewarded for their enterprise.

The Boat Loan company, we learn, are building fifty additional boats for next years business, and a number also will be built by individuals.

Reading Railroad.—The coal transported over the road during the year 1849, was distributed as follows:

	Richmond.	Phil.	Lines.
From Port Carbon.	258,643	45,073	49,211
" Pottsville	111 330	7,894	20,114
" S. Haven	365,023	71,324	52,113
" Port Clinton..	68,372	41,678	24,144
			145,581

To Philadelphia.....165,969
To Richmond.....804 368

Total tons.....1,115,918

The present machinery of the railroad was not worked up to its full capacity during the last season, by about 200,000 tons; therefore it is presumed that no increase will be made to it during the present season.

Of the 1,115,918 tons of coal sent to market by this railroad, about 800,000 tons were sent to Richmond—the balance to Philadelphia, and on the line of the road.

The toll received for coal was 1,675 000 dollars. The total receipts on the railroad are about 1.985,-000 dollars, expenditures about 985 000 dollars, leaving 1,000,000 profits, yielding 6 per cent. on about $16,500,000, the amount invested in the road and machinery.

The company employed during the year 900 men 36 locomotives, and 5 085 coal cars.

Schuylkill Navigation.—This canal is 108 miles long, and up to the present time has cost, $8 445,-810 37. Its capacity when opened in 1825, was for boats carrying about 20 tons—during the last season, a boat carrying 187 tons, passed through this navigation, and its capacity will soon be capable of passing boats carrying 200 tons. The quantity of coal carried to market last year was 489,208 tons. The tolls received on coal amount to 312,523 37 dollars. The largest quantity of coal sent to market by this avenue, was 584,692 tons in 1841, 95,745 tons more than last year. The following is the total estimated investment in the work;

Capital stock.....	$1,665,000 00
Loans.....	6,790,219 37
530 boats at a cost of.....	800,000 60
1600 horses at a cost of.....	80,000 00
	$9,335 819 37

The number of boatmen employed on the Schuylkill navigation is estimated at 1500.

Commercial.

Trade of Buffalo.—The principal articles received at Buffalo via the lakes, from the opening to the close of navigation for the past four years were as follows:

	1846.	1847.	1848.	1849.
Flour, bbls.	1,375,500	3,857500	1,249,000	1,207,435
Pork "	79,420	63,700	66,000	50,951
Beef, "	28,252	38,900	54,812	61,996
Seed, "	17,640	22,536	22,020	21,072
Bacon,* lbs.	———	———	———	5,193,900
Lumber, ft	17,536,000	17,313,00	21,425,000	33,930,768
Wool, lbs.	21,000	20,223	40,024	49,072
Fish, bbls	6,499	3,943	6,623	5,963
Tobacco, hhds	3,022	1,114	385	2,057
Hides, No.	50,660	64,280	70,750	62,910
Lead, pigs	25,960	16,748	27,953	14,742
Pig iron, tons	2,200	3,856	4,132	3,432
Coal, "	4,430	7,717	12,950	9,570
Hemp, lbs.	26,021	1,062	866	414
Wheat, bu	4,745,000	6,489.100	4,520,117	4,943,978
Corn, "	1,415,308	2,862 300	2,208,100	3,321.651
Oats, "	290,000	446,000	500,000	362,285
Rye, "	28,250	70,787	17,809	5,253
Lard, lbs.	6,100,300	3,436.000	5,632,112	5,311,037
Tallow bbls	4,045	3,035	4,490 lb.	1,773,650
Butter, lbs	3,510,000	5,079,300	6,873,000	9,714,170
Ashes, casks	24,612	7,338	9,940	14.580
High wines	15,031	18.100	38,700	38,753
Leather, rls.	9.998	4,960	3,313	3,870

* In 1846, '47 and '48, included in Pork.

Importations for 1849.

The following statement, in the Washington correspondence of the Tribune is deserving of attention, as showing the practical operation of the present tariff, in the large consumption of foreign articles which it creates:

Summary Statement of the quantity and value of goods, wares and merchandise imported into the United States during the year ending June 30th, 1849.

GOODS FREE OF DUTY.

Gold and silver coin and bullion.....	$6,651,240	
Tea, 16,319,789 lbs. valued at.....	4,074,789	
Coffee, 165,334,700 lbs. valued at....	9,058,352	
Copper, in plates for sheathing vessels.....	1,044,755	
Other sheathing metal.....	220.036	
Copper ore.....	177,736	
Other articles free of duty..	1,152,857	
Total amount free of duty———		$22,877,665

GOODS PAYING DUTIES.

Manufactures of wool and carpeting.....	$13 704 606	
Manufactures of cotton...	15,754,841	
" of silk.....	14,175,767	
" of silk and worsted & camblets.	2,487,305	
" of flax and hemp.....	6,427,016	
Linen and cotton laces and insertings.....	340,366	
Ready made clothing and other articles of wear...	587.590	
Hats, caps and bonnets...	1,150,964	$55,128,455

IRON AND STEEL.

Bar iron manufactured by rolling, 173,457 tons, valued at.....	$6,060,068	
Bar iron manuufactured otherwise, 1,598 tons, valued at.....	525,770	
Pig iron, 105,632 tons, valued at.....	1,405,613	
Hoop and sheet iron, 25,-028,782 lbs., valued at...	543,256	
Steel, 6,690 tons.....	1,227,188	
Manufactures of iron and steel, cutlery and hardware, inclusive.....	5,297,116	
———		$15,058,961

LEAD, COPPER, TIN AND BRASS.		
Copper and manufactures of copper and brass	1,397,845	
Lead, and manufactnres of lead	86,257	
Tin, and manufactures of tin	1.903,440	4,387,542
Watches and parts of watches		1,676,606
Metallic pens		74,050
Porcelain, China and other earthen ware		2,483,219
Opium, 92,068 lbs. valued at		190,316
Raw hides and skins		3.507,300
Wool, 17,869,022 lbs. valued at		1,177,347
Leather	434,765	
Gloves for men, women and children	772,217	
Other manufactures of leather	253,143	$1,460,125
Wine in casks, 5,186,437 gallons, valued		1,269,344
Wine in bottles, 160,092 doz., valued at		551,813
Distilled spirits, 3,402,859 gallons, valued at		1,821,255
Molasses, 23,796,806 gals., valued at		2,778,174
Sugar, sugar candy and syrup, 259,326,584 lbs. valued at		8,079,739
Linseed oil, 1,163,647 gals. valued at		487,920
Saltpetre		462,065
Soda		637,965
Tobocco, snuff and cigars.		1,720,306
Hemp, unmanufactured, 86-892 cwts., valued at		491,633
Manilla and other hemp of India, 36,806 cwts. valued at		196,634
Flax, and tow of flax and hemp, 21,809 cwts. val. at		284,357
Rags, 14,941,236 lbs. valued at		524,755
Salt, 11,622,163 bushels		1,438,981
Coal, 196,213 tons		406,282
Fish, 188,593 bbls.		633,053
Potatoes, 71,553 bushels		20,602
Articles not specified, paying 5 per ct.		1,702,012
do. do. do. 10 do.		1,030,131
do. do. do. 15 do.		286,078
do. do. do. 20 do.		1,893,652
do. do. do. 25 do.		155,090
do. do. do. 30 do.		1,641,737
do. do. do. 40 do.		141,741
All other articles		10,607,534
Total products paying duties		125,479,774
Total products free of duty		22,377,665
Total imports for year ending June 30, 1849		147,857,439

The whole quantity of iron, steel, castings, anchors, chains, cutlery, hardware, and all other manufactures of iron and iron and steel, amounted to about 345,000 tons. The weight of the hardware and some of the cutlery not being stated, the exact number ot tons cannot be ascertained with any more certainty than is above given.

Pennsylvania.

Pennsylvania and Ohio Railroad.

The annual meeting of the company was held at Pittsburg on the 10th instant. The report of the directors was read by the president of the the company, the most material parts of which we give below:—

The report of the board of directors submitted to the stockholders on the 18th day of January, 1849, embracing only a few months of the then corporate existance of the company, was necessarily confined to a brief detail of the incidents connected with its primary organization—a statement of the amount of stock subscribed, which was barely sufficient to authorise the issue of letters patent, and the limited operations of the engineer corps, in preliminary explorations and surveys of the country through which the road was designed to penetrate. The company was then in its earliest stage of infancy, with limited means, adverse interests, conflicting opinions, and jealous rivals, to contend with at every step of its progress. The board has now, however, the pleasure to congratulate you on the disappearance of many, if not all the minor difficulties, and an accession to the stock of the company, from $50,000, to over one million of dollars, subscribed by respectable individuals and corporations. The amount of capital stock, though yet inadequate to the entire completion of the whole work, was, however, deemed fully sufficient to authorise the board in placing a large portion of the work under contract, which has, accordingly been done, from the mouth of Beaver to the Ohio state line, a distance of 23 miles. From a point near the intersection of the Cleveland and Wellsville road to Massillon, 22 miles, and five miles of the only difficult part of the route, near the eastward of the town of Wooster, an aggregate of 50 miles.

The line from hence to Big Beaver, 25 miles, is now nearly prepared for letting, and it is designed by the board to place it under contract in season to commence work early in the spring, and prepare it for the track within 12 months from the commencement of the work, together with the division from Beaver to the state line.

The subscriptions in Columbiana county yet fall short of the sum which the board deem necessary to authorise it in placing the work in that county under contract; the assurances, however, recently given on that subject, justify the conclusion that the subscription will speedily reach the required sum, and that portion of the work proceed simultaneously with the Ohio river line, and closing the contracts continuously from hence to Massillon. Beyond that point, to the 5 miles letting, near Wooster, heretofore adverted to, the character of the work is so favorable that it can be readily completed in a very short period; true economy, therefore, would dictate a brief suspension of that interval of the road until the heavy jobs, near Wooster, have been for some months in progress, all of which can be completed simultaneously with the eastern division.

The contractors commenced work about the 1st of September last, and have been steadily prosecuting their respective contracts, several of which are nearly completetpd, and the whole line hence to Wooster, 130 miles, may be prepared for the rails by the spring of next year.

You will have perceived from preceding remarks that it is the design of your board, should no unforeseen obstacles arise, to place under contract the whole line not heretofore let, between this city and Wooster at a very early day, and prepare the road bed for the rails which it is believed, with adequate means, may all be accomplished within the present year, with the exception of a few heavy contracts to be completed in the following spring. If the requisite funds are provided with sufficient promptitude, it is the opinion of the Chief Engineer that the whole line can be in use, and the trains running to Wooster in the autumn of 1851.

Where the undulations of the country require the line to deviate from a level, the grades in all cases are less than 50 feet to the mile, and there is no curve of a less radius than 1000 feet. From Wooster westward, by Loudonville and Mansfield to the intersection with the Cleveland, Columbus and Cincinnati railroad, and the proposed point of junction with the Bellefontaine and Indiana railroad, the distance will be about 50 miles, requiring no grade exceeding 26 feet per mile.

It is highly gratifying to perceive the rapid and growing importance which the work you have undertaken has assumed in one short year. It is now confessedly esteemed throughout the country as the second link in the great chain of internal intercourse which is speedily to unite the Atlantic cities of our inland seas—of the Ohio and Mississippi vallies—and ultimately the Pacific coast, by the shortest and best route, rendering Pensylvania like Palestine of old, the thoroughfare of nations.

The remainder of the report is chiefly taken up in presenting the inducements to the construction of this road in its business prospects, and in vindication of the route finally selected. In reference to this the report says:

The lines of railroad heretofore constructed and in progress from tho Ohio river to the lakes, received their impetus from the great barrier which the Allegheny Mountains presented to the speedy and convenient transit of travel and trade between the west and the east—the facility of their construction and connection with the New York railroads, by means of the navigation of Lake Erie, thus turning the northern confines of Pennsylvania, and operating to a ruinous extent upon the interests of the state, by the division of a large portion of the summer transportation and travel. Thus the Cincinnati and Sandusky, the Cleveland and Columbus, the Mansfield and Sandusky, and the Wellsville and Cleveland roads, from their very nature and geographical position, are calculated to diminish the travel, and, consequently, the trade through this city, by inviting them to the lakes before they reach its borders. The construction of your road, however, will not only neutralize the existing tendency in that direction, but ultimately and inevitably (in connection with the Pennsylvania railroad surmounting the barrier of the Alleghenies) force them to become our tributaries, by the fact that we shall offer at every point of contact with their roads a difference of distance to the seaboard, varying from 80 to 140 miles in our favor; then will these roads, which heretofore operated to abstract, pour in from the southwest, and the northwest, from the Ohio and the lakes, like their own natural tributaries, an exhaustless stream, swelling the tide of trade and travel to overflowing upon the great central avenue through Pittsburgh and Pennsylvania.

A single illustration will suffice. Thus a traveller from Cincinnati to New York or Philadelphia, those great emporiums of commerce, will, at Columbus, be as far advanced on his journey, by taking the Ohio and Pennsylvania railroad, as though he had travelled the whole distance from that city to Cleveland, and when even at Cleveland, by taking the route leading through Pittsburg, he would be eighty miles nearer New York; and should Philadelphia be his destination, he will be 260 miles nearer his journey's end than by pursuing the lakes, or even by a lake shore route—should the right of way be ultimately obtained, from the constituted authorities of Pennsylvania. Figures, it is truly said, lie not. The distance from Columbus to New York, via Pittsburg and Philadelphia, is ascertained by the results of experimental surveys to be 660 miles. The distance from Cleveland by the lake or lake shore to New York, is 665. The distance from Columbus to Cleveland, 135 miles, actually saved. Time is economy; distance is money; and the rate of fare regulated as it will be by distance, is money, and all combined must and will regulate the great stream of travel. The same causes and the same reasoning prevail with regard to the influence of our roads from the lakes as from the Ohio. Thus, at Cleveland, a traveller is 80 miles nearer New York, by the Pennsylvania routes; at Sandusky, by the Mansfield road, 54 miles are saved, and at Toledo, Adrian, and every point on the Southern Michigan railroad, on to Chicago, the young queen of the likes, the same relative advantages in time, distance, and economy of travel prevail.

The report of the president is a very interesting document, and we regret that we cannot publish the whole of it. Accompanying it is a letter from Mr. Roberts, Chief Engineer of the road; but as it contains little that is not embraced in the report of the President, and as it is soon to be followed by a more detailed report of matters more particularly belonging to his own department, we omit any extracts from his letter at the present time.

The formation of a continuous line of railway from Philadelphia to the western boundary of Indiana, is one of the greatest projects of the kind ever yet attempted; and as the work of constructing the several links is going on simultaneously, every person who is engaged upon the different sections of it regards himself as a party to the work as a whole—and the importance of the local lines is almost entirely lost in the idea of the vastly greater work which is to result from the united labors of all.—

Such a conviction gives us the surest guarantee we can have of success, both as regards the providing the necessary means and the vigorous prosecution of the work.

Portland and Montreal Railroad.

We learn that Messrs. Wood, Black & Co., the contractors for this road, have purchased of the Coalbrook Dale Company 10,000 tons of rails for the Portland and Montreal railroad, one half deliverable in Portland at $44 per ton, and the other half at Montreal at $36 per ton, free of duty and all charges.

We are assured too, that the work of construction is going on vigorously at each end, under the con tract for its completion in three years.

Coal Trade of Baltimore.

The following is a monthly statement of the quantity of coal transported over the Baltimore and Ohio railroad during the year 1849:

January...tons..	4,531	August...tons...	12,852
February.....	7,043	September.....	16,383
March.....	9,838	October.....	13,425
April.....	9,537	November.....	15,917
May.....	11,183	December.....	6,186
June.....	15,622		
July.....	13,286	Total.....	135,776

Some portion of the above was for intermediate points along the line of the road between Cumberland and Baltimore, and did not come into Baltimore.

Virginia.

Interesting Statistics—Under a resolution of the House of Delegates, the 1st Auditor, Jas. E Heath, Esq., has laid before that body a very important document showing

I. The white population in 1849 of each of the four grand divisions of the commonwealth, calculated from the titheables, and which will be verified by the census.

II. The revenue which each division pays, with and without the taxes on licenses.

III. The apportionment of representation to each, on the 1st the white basis, 2d the white and revenue basis, without the taxes on licenses, and 3d the mixed basis of white population and license taxes.

We give a brief synopsis:

1. POPULATION.

1. Or tide water Division.....	192,660
2. Or tide water to Ridge Div.....	209,970
3. Valley " "	160,557
4. Trans Alleghany " "	324,530
	887,717
White population in 1840.....	740,968
Increase in nine years.....	146.968

2. REVENUE.

I. Div.....	$163,977 25	$262,385 63
2. "	155,512 07	194,492 63
3. "	77,572 36	98,628 71
4. "	75,494 63	105,506 53
	$472,516 31	$661,013 50

3. APPORTIONMENT OF REPRESENTATION.

1ST. WHITE BASIS.

	Delegates.	Senators.
1. Div.....	29	7
2. "	32—61	7—14
3. "	25	6
4. "	49—74	12—18

Western maj. 23 in House and 4 in Senate.

2. MIXED BASIS.

	Without Licenses.		With Licenses.	
	Del.	Sen.	Del.	Sen.
1. Div.....	38	9	41	10
2. "	38	9	36	9
3. "	24	6	22	5
4. "	35	8	36	8

Eastern majority in the House 17, in the Senate 4, on the basis of white population and revenue without licenses; or 19 in the House and 6 in the Senate, with license.

Massachusetts.

We gather from the late Message of the governor of this state the following statement of its financial condition:

The receipts for the past year amounted to.....	$540,658 35
The expenditures to.....	601,604 23
Excess of expenditures over receipts...	60,945 88
The above amount of receipts includes cash on hand, Jan. 1, 1849.....	11,354 64
Railroad stock sold.....	13,400 00
State Reform School scrip sold.....	25,000 00
This sum.....	$49,754 64
deducted from the whole receipts 540,658 35, leaves 490,903 71 as the ordinary receipts for the year.	
The amount of expenditures includes the sum paid the State Reform School under the act of 1849.....	25,000 00
Railroad loans.....	9,000 00
Temporary loans of 1847, repaid.....	15,000 00
Temporary loans of 1848.....	10,000 00
Balance paid for weights and measures	29,395 00
This sum.....	$88,395 00
deducted from the whole expenditure, 601,604 23, leaves, as the ordinary expenditure of the year, 513,209 23.	
The receipts for 1849 are less than the estimate of the Treasurer, made early in the year:	
From the auction tax, about.....	11,000 00
And from alien passengers.....	27,000 00
Making.....	$38,000 00

The alien passenger money was cut off by the decision of the Supreme Court of the United States, which pronounced the law of the state, by which it was imposed, unconstitutional. But for that decision the revenue of the year from that source would probably have been increased more than thirty thousand dollars.

The property of the commonwealth consists of	
Western railroad stock.....	1,000,000 00
Western railroad stock sinking fund	593,000 00
Commonwealth's part of Western Railroad loan sinking fund.....	123,500 00
Notes for lands in Maine.....	1,758 00
Cash on hand.....	4,000 00
	$1,722,258 00
The debt of the commonwealth:	
Western railroad scrip, due in 1847, is.....	995,000 00
State Reform School scrip.....	25,000 00
Temporary loans.....	65,000 00
Making.....	1,085,000 00
Her lands in Maine are estimated at	1,500,000 00
Her claims upon the General Government.....	181,000 00
	1,681,000 00
The Massachusetts School Fund amounts to.....	903,000 00
The School Fund for Indians.....	2,500 00
Charles River and Warren Bridge Fund.....	21,481 18
	$926,981 18

The commonwealth has heretofore pledged her faith for the payment of the debts of certain railroad corporations. These corporations promptly pay the interest which accrues on their debts, and the state is amply secured by mortgages against future contingencies.

Institution of Mechanical Engineers.

At a meeting of the above institution held at Birmingham, November 24th, R. Stephenson, Esq., M. P., in the chair, the following papers were read:

On the Construction of Railway Axles.—By J. E. M'Connell.

When the railway system was first introduced into this country, the question of strength of materials for constructing the new stock was, it is to be presumed, materially influenced by the amount of experience derived from the vehicles which had previously been in use for the conveyance of traffic.

As the new system became extended and improved in all its arrangements, and the facilities which it possessed for conveying greater loads at higher speeds were gradually developed, the working stock was necessarily changed from time to time in conformity with the greater demands for convenience and stability. Improvements in almost every point have been carried out, until we have now in operation the railway stock, generally speaking, in an excellent condition for the purpose to which it is applied. It is remarkable that, notwithstanding the importance of proportion and quality as first elements in considering the strength of the materials of which railway moving stock is composed, no rule, generally applicable, for even the main features of this great system of machinery, has been established. Without attempting to embrace the whole subject, although one of great importance to proprietors of railways and the public generally, I conceive it is proper, in this place, to express my strong conviction that the general question of the strength and quality of those materials justly proportioned to the strains to which they are subject, and bearing reference to accidents from collision, faults of road, deterioration from a variety of causes, &c., must eventually be treated with great attention and consideration; and, in order to insure safety to life and property for all who use railways as well as the greatest possible economy for the profit of those who have embarked their capital in their construction, I believe it will be found essential to have some regulations founded upon the joint experience of those parties who have been practically engaged in managing and working the different departments of railways.

It is well known that short-sighted economy has been practised in many instances in giving directions for the purchase and repair of railway stock, and it is only dear-bought experience which can effectually convince those who, to make a little saving by purchasing a cheap, ill-constructed machine, gain a great and constant loss while it is in use.—The advantages of a general and constant interchange of opinion among those parties to whose judgment and management the working expenses of the different railways are entrusted is most important; and if such varied experience could be collected, regularly and systematically into one focus, where it might be digested and prepared for practical use, the effect for good to the general system of railways would be very great, and, in a scientific point of view, the results recorded would prove highly interesting. Having thus briefly stated a portion of my views as bearing upon the introduction of the best means of producing uniformity in the working stock of railways, I will now proceed to consider railway axles, which, as an important part of the great machinery, are deserving of the most marked attention.

I have endeavored to ascertain whether any data were available which might assist me in forming a groundwork of the results of combined experience on this subject; but I regret to say that, although my inquiries have been in all cases promptly and carefully attended to, yet the object which I had in view has not been attained. As an example of the diversity of opinion, or rather, perhaps, the want of some certain rule to guide engineers in proportioning the strength of axles to their weights and strains, I would refer to different forms of axles now in use on one portion of one railway, and in doing so would remark, that a clearer proof could not be afforded of the desirableness of having some defined principle to guide us in deciding on the strength for railway axles. For obvious reasons I wish particularly to guard against expressing, directly or by inference, any opinion on any description of manufacture of axle, or even quality of iron of which axles are composed. I would wish to limit the scope of the present paper simply to the question of form and dimensions of axles, with the changes and deterioration to which they are subject in process of working, assuming, in all cases, the material of which the axle is made, and the mode of manufacture, to be of the most approved description.

In order to arrive at a knowledge of the best form and dimensions of axles, we have first to ascertain

the load and friction to which they are to be exposed; and secondly, to estimate, as nearly as possible the strains to which they will be subject whilst in motion. Supposing a waggon or carriage to be constantly in a state of rest, it would, of course, then only be necessary to consider the axle as a beam or girder, sustaining a load of five tons upon the two journals, the points of support being the wheels resting upon the rails, the middle portion of the axle being of sufficient strength to sustain the wheel or prop in its perpendicular position. We then require to find out the proportionate strength, so that each section of this beam or girder shall only be sufficiently strong to resist the strain or load to which it is then suoject.

It is ascertained by an approximate calculation, *that a journal of 1·128-inch diameter is not capable of sustaining a heavier load, when in a state of rest, than 2½ tons, or 5,600 lbs.; and allowing, in practic, that the wagon or carriage axle ls made ten times the breaking strength, the diameter of the journal would be, adopting the same calculation, 2·43 inches.* In these calculattons the strength alone is considered; but we have also to take into account the question of friction, and likewise the tendency to abrasion. With our present means of information, no accurate data are available for determining the best proportion of journal or bearing according to the weight it has to bear, or the velocity at which it is required to move. A great variety of proportion is in use, but it is fair to note that in engine-axles, particularly the length of bearing, depends, to a certain extent, upon the construction and arrangement of the engine; as a general rule, the length of the bearing is not in due proportion, according to our general experience, to the diameter. —*Civ. Eng. & Arch. Jour.*

To be continued.

AMERICAN RAILROAD JOURNAL.

Saturday, January 19, 1850.

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THE UNDERSIGNED IS PREPARED TO contract for the delivery of the above quantity at any port of the United States. Can be made of any required pattern and of a favorite brand.

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☞ The attention of our readers is invited to the large number of new advertisements in our present number, among which is an extensive catalogue of valuable scientific publications for sale by John Wiley, 161 Broadway, and which are standard works upon the various subjects on which they treat.

CHEMICAL ANALYSES OF MANGANESIAN WHITE CAST IRONS. BY CHARLES T. JACKSON, STATE ASSAYER, ETC.

Having received, through the politeness of Messrs W. E. Coffin & Co., some samples of hard white pig iron, I undertook their analysis, for the purpose of determining the proportions of manganese which they contained.

I herewith present the results which I have obtained, trusting that they may prove interesting to iron masters and founders.

Specimen No. 1.—This metal is highly crystaline, resembling in color and structure pure metallic antimony. It is lammelar, and bladed, and is very hard and brittle. Its specific gravity is 7·684 pure water being 1. This specimen was broken from a pig of cast iron obtained from Capers furnace in Easton, Pennsylvania. A clean bright piece of the metal, weighing 0·5 gramme was analysed and yielded per cent.—

Iron	91·10
Manganese	5·76
Carbon and silica	3·14
	100·00

Specimen No. 2, was obtained from the furnace in Plymouth, Vt., and was made from a brown hematite, mixed with black oxide of manganese. The metal is hard, white, brittle and crystaline, and contains flattened crystals in its centre.

The massive metal is made up of crossing plates of crystals, giving its broken surface the appearance of meteoric iron, that has been acted upon by acids. Its specific gravity is 7·488.

Some crystals were broken out, and submitted to analyses, and the following resutts were obtained:

Iron	83·2
Manganeee	9·6
Carbon and silica	10·0
	102·8

Specimen No, 3.—This metal was obtained from the furnace at woodstock, New Brunswick, and was reduced from a manganesian red-brown hematite. The metal is white, hard, and granular-crystalline, with some small crystalline plates crossing each other. It breaks readily under the hammer, when struck with a smart blow. Its specific gravity is 7·330. On analysis it was found to consist of

Iron	82·22
Manganese	16·26
Carbon	0·36
Silica	1·40
	100·24

The ore from which this metal was smelted was analyses in my labratory, last year, by Mr. Richard Crossley, who obtained the following results:

Silica	17·80
Carb. lime	4·00
Alumina	2·10
Per oxide of iron	52·50
Oxide of manganese	18·00
Water	5·70
	100·00

52·50 per oxide of iron contains 36·39 of metallic iron, and 18·90 of manganoso-manganic oxide contains 13·62 of manganese, 36·39 + 13·62 = 50·01 combined metals.

Then 50·01 : 13·62 : : 100 : 27·23 manganese. Hence more than half the oxide of manganese in the ore was reduced in the furnace, and alloyed with the iron, the rest having been removed by combination with the slag.

The nature of these alloys of manganese and iron is not generally known to iron masters and refiners, though many have a practical knowledge of their working, without understanding the principles by which they should be guided. It is known that such kinds of iron will not answer for foundry purposes, and that they are suitable for the manufactnre of bar iron, making a very tough and good metal, admirably adapted for conversion into steel. It is known also that iron of this kind works slowly in the puddling furnace, and in the forge, and that it "*comes to nature slowly,*" but makes a good mixture with irons rich in carbon, which "*come to nature*" *too quickly* and are liable to "*loom up*" or to be "*hot short,*" when placed under the tilt hammer: but still grave errors are committed in judging of the metal, from its appearance, and pig iron containing sulphur or phosphorus is not unfrequently mistaken for manganesian iron, and serious loses arise from such mistakes. A series of exact chemical analyses of the different kinds of iron made in the furnaces of all parts of our country, and of the principal varieties of iron which come to this country from abroad, is required, in order to render the metallurgy of iron more perfect and certain.—We ought also to have the principal ores of iron which arrive in this country thoroughly analysed, in order to learn their peculiarities and value.

How much capital might have been saved if chemical examinations had been made of the ores anterior to the erection of costly furnaces for smelting them! Where analyses are made, it too often happens, that, from an erroneous idea of economy the chemist is limited to the mere determination of the amount of iron in the ore, and is not authorised to make a full and *thorough analyses* of all *the admixtures,* which are really of vastly more importance than the mere percentage amount of iron in the ore; for it makes but little difference whether an ore contains 35 or 50 per cent. of iron, the admixtures being far more important, serving for flux in one case, and rendering the iron almost irreducable in another.

It is desirable that we should *combine the skill of practical and scientific men together in the examination of the metallurgy of the Uniled States;* for they eannot thoroughly work out the problem without mutual aid. We should first review all that is doing here, and then examine what is known in Europe, and apply the knowledge we obtain from abroad to our own works. We ought to have an able *metallurgic commission* appointed by the government of the United States, to obtain the information desired. France long ago explored, by her commissions, the mines, furnaces, and foundries of Great Biitain, and all nations now draw for information upon the "*Voyage Metalurgeque en Angleterre, par M. M. Dufrenoy, Elic De Beaumont, Coste et Perdonnet.*"

Boston, January 12, 1850.

Ohio.

Hamilton and Eaton Railway.

The Eaton Register confidently assures the public that the proposed railway from Hamilton *will be constructed.* The difficulties about routes, &c., are reconciled, and the Directors and Stockholders are busily engaged, arranging matters to locate the road and put it under contract. The Engineer, Erwin, is reconnoitering for a route to Richmond, by way of Paris. No obstacle is found on the route, and the people along the line "manifest a zeal and energy not before witnessed." They are *now* for going ahead.

Mr. Erwin, in a letter to the Enquirer, says—"I am now fully warranted in asserting that a *cheaper line* can be obtained by the way of Hamilton and Eaton to the west and northwest, at 30 feet to the mile, *than on any other route south or south-west of it, at* 40 *feet to the mile.*" This he says "will be proved by a comparison of the field routes, profiles, &c., whenever the surveys are made on the other lines by competent and careful Engineers."

Virginia.

Louisa Railroad—Western Extension.

On Thurrday last, the portion of the road, extending from Waynesborough to Staunton, a distance of 12½ miles, was let on very favorable terms. Four miles are taken by Goodman, Seay & Co., and three by Wright and Farish, of Albemarle, and one by Crickard and Brown, of Augusta. The remainder by contractors from Pennsylvania and Maryland. The price ranges between 8 and 9 cents per cubic yard, and the excavation will cost eight thousand dollars less than the estimate of the Engineer. The maximum grade, going east, is 65 feet to the mile, and 68 feet in the other direction. The work is to be finished by the 25th December, 1850, By the fourth of July, 1851, the road from Charlottesville to Staunton will be finished to within a mile of the Tunnel, on each side of the mountain. A *portage* of about three miles will, for a year or two, interrupt the continuous use of the

steam car.—Passengers will cross the mountain in coaches.—*Lynchburgh Virginian.*

Massachusetts.

Boston and Lowell Railroad.—The following gentlemen have been unanimously re-elected a board of directors of this road for the year ensuing :—W. Sturgis, Geo. W. Lyman, Joseph Tilden, Jno. A. Lowell, Eben Chadwick.

Steamboat Building at Pittsburg.

There were built last year in the Pittsburg district 51 steamboats, of which 37 were built expressly for the Pittsburg trade, and 14 for the different points in the west and south. The aggregate amount of tonnage of the whole is 7215 tons.

Canal Commerce.

CANAL COLLECTOR'S OFFICE,
Cleveland, Jan. 1, 1850.

Statement of some of the principal articles of property that arrived at, or was cleared from, Cleveland, by way of the Ohio Canal, during the years 1848 and 1849.

ARRIVED.

	1848.	1849.
Barrels Flour	417,524	376,112
" Pork	26,111	23,031
" Whiskey	41.135	36,233
" Linseed oil	1,157	803
Pounds Pot and pearl ashes	64,384	194,441
" Pig iron	7,077,965	6,344,395
" Butter	2.544,394	2,041,854
" Bacon	1,620,155	1,145,683
" Lard	1,636,803	1,723,866
" Tallow	206,828	263,206
" Iron and Nails	15,674,989	10,434,591
" Wool	1,925,451	1,910,474
Bushels Mineral coal	1,925,451	1,910,474
" Corn	661,454	547,605
" Oats	165,955	13,107
" Wheat	1,585,270	851,123
Pieces staves and heading	247,241	404,886
Perches stone	10,182	12,441
Cords wood	4,965	4,267

CLEARED.

	1848.	1849.
Barrels Salt	72,400	74,742
" Lake fish	9.782	13,225
Pounds Merchandise	13,832,416	13,471,180
" Furniture and baggage	678,103	738,420
" Gypsum	2,259,756	2,133,486
" Castings	1,096,026	958,817
" Machinery	172,760	55,226
" Ohio Saleratus	474,762	346,645
" Pot and pearl ashes	268,537	255,342
" Other salts of ley	56,756	6,215
" Marble	1,563,080	1,414,391
" Hides and skins.	128,886	226,333
" Clocks	58,128	39,010
" Grindstones	145,727	258,052
" Feet Lumber	4,906,920	7,111,576
Shingles	4,556,250	4,662,250
Split Hoops	1,840,826	1,244,170

The amount of toll collected at this office during past year is $88,541 50
The amount collected for the year 4848 was 80,510 25

Increase $8,031 25

Process for Improving Iron.

The Baltimore Sun alludes to some recent tests of an improved process in the manufacture of steel at Coleman's Works, in York, Pa. The invention is by Dr. Wall. of London. It consists in passing a current of voltaic electricity through a mass of fused metal during the time of its melting, cooling or consolidation, either in the blast, puddling, balling or other furnaces, the consequence of which is, that all sulphur, phosophorus, arsenic, or the semi-metals ever, more or less, found in all metals and ores, are evolved or driven off, which, if allowed to remain, would interfere with the molicular arrangement, make the metal brittle and otherwise deteriorate its quality. The tests made show, the Sun says, the improvement embraced in the discovery to be decidedly the greatest and most economical that has ever been placed within the reach of manufacturers.

The Whale Fishery of 1849.

The Whaleman's Shipping List of New Bedford, publishes a condensed list of the importation of sperm and whale oil and whalebone into the United States in 1849 :—

Ports.	Ships and Bks.	Brigs Schs.	Brls. Spm. Oil.	Brls. Wh'le Oil.	Lbs. Wh'le Bone.
New Bedford	63	1	46,338	72,962	797,300
Fair Haven	13	..	10,806	18,998	150,100
Mattapoisett	2	1	780	19	..
Westport	3	1	2,518	100	500
Dartmouth	..	1	8	28	..
Falmouth	1	..	2,060	115	..
Edgartown	1	..	118	2,742	18,800
Nantucket	13	..	18,887	6,461	68,200
Provincetown	2	15	2,924	277	..
Boston	3	1	1,360	3,445	202,309
Lynn	1	..	383	1,580	..
Somerset	1	..	140	..	..
Fall River	4	..	856	8,049	140,600
Providence	2	..	2,317	4,542	30,200
Warren	6	..	2,384	10,626	61,500
Newport	1	..	1,055	..	..
Stonington	8	..	1,628	15,334	97,500
Mystic	5	..	1,509	6,747	51,100
New London	17	3	1,949	38,030	301,100
Bridgeport	1	..	354	2,702	27,300
Sag Harbor	16	..	1,797	37,579	186,400
Greenport	4	..	587	7,487	78,400
Cold Spring	3	..	299	8,697	68,600
New Suffolk	1	..	242	314	1,200
New York	1	..	195	1,655	..
Quincy	..	1	..	4	..
Total	171	26	100,914	248,492	2,281,100
		Brls. Sp.	Brls. Wh.	Lbs. Bone.	
Imports for 1848		107,976	280,656	2,003,000	

The exports to foreign ports in 1849 were, from Boston, 93,875 gallons sperm, 93,770 gallons whale, 4500 pounds bone; from New Bedford, 7421 bbls. whale oil.

Georgia.

Central Railroad and Banking Company.—At an election for Directors of the Central railroad and Banking Company of Georgia, held yesterday, the following gentlemen were elected:

R. R. Cuyler,	J. W. Anderson,
Wm. Crabtree	Solomon Cohen,
Joseph S. Fay,	Henry McAlpin,
Wm. B. Johnston	John R. Wilder,
Thomas Purse,*	

* New Director. [*Sav. Rep.*

Bank Returns.

We have received the annual abstract made by the Secretary of State, of the returns from the several banks in the state, of their condition on the first Saturday in October. At that time there were in operation, 119 banks; 27 in Boston and 92 out of Boston.

Capital paid in	$34,630,011 00
Bills in circulation	15,700,935 25
Net profits on hand	3,011,996 21
Balances due other banks	4,720,815 31
Deposites without interest	9,775,316 97
Deposites bearing interast	746,415 66
Total due from the banks	68,685,490 40
Specie &c. in banks	2,749,917 32
Real Estate	1,126,161 67
Bills of other banks	3,737,151 00
Balances due from other banks	4,472,950 72
Debts due, except from other banks	56,599,300 69
Resources of the banks	68,685,400 40
Dividends in October, 1848	834,850 00
" April, 1849	1,253,545 00
" October, 1849	1,195,947 34
Reserved profits	2,724,513 20
Debts secured by stock	785,775 63
Doubtful debts	193,531 31

By these returns it appears that the specie of the banks amounts to $2,686,741; and their circulation and deposites, to $26,322,667; which is equivalent to $0,50 of paper for $1 of specie. The amount of dividends and the amount of reserved profits are particularly deserving of attention; as the dividends, the profits, and the expenses, (which ought also to be included in the returns,) show how great is the absorption which the banking system makes from the public industry.

North Carolina.

A Home-made Locomotive.—We have had the pleasure of examining the new locomotive John M. Morehead, (named after Ex-Gov. Morehead,) which was turned out about three weeks since from the machine shop in this town of the Wilmington and Roanoke railroad company, having been made there, under the superintendence of Mr. Jonathan Lees, who has charge of the shop. It is an 8 wheeled engine, of about ten tons weight; is put together in an excellent manner, and performs most satisfactorily. It is in use on the W. and R. railroad. Another, intended to be of considerably greater weight and power, has been commenced in the same shop. Success in every way to North Carolina skill and enterprise.—*Wilmington Chron.*

On Straightening Tempered Steel Work.

I beg to send you a method to bend straight thin steel works which have become twisted in the process of tempering. If you think it would be found useful, I shall be glad if you will give it a place in your valuable work.

If, after tempering, the work has got twisted, I heat a piece of iron proportioned to the size of it, and fix it in the vice, and then pass the convex side of the work over the iron in contact with it, until it becomes as warm as the temper will allow of; and to ascertain this, a part must be cleaned on the concave side to show the color. I then take a wet cloth, and apply it to the convex side to cool it suddenly, and leave the concave side expanded.—While the work is heating, and until after the cloth has been applied, the work must be held at the extremities of the curve, and a little pressure given towards the convex side. This process is well suited for delicate work, as it leaves the fine skin unmarked, which would not be the case if the hammer were used.—*Prac. M. Jour.*

Gas from Water.

We copy the following from the Washington Union, not that we give full credit to the discovery claimed, but rather as a statment of what we have no doubt will eventually be realized. We fully believe that one of the component parts of water is to give us light and heat, but we do not believe that Mr. Paine, at one single bound, has gone so far ahead of all the discoveries that have yet been made in this direction. As he claims to have brought this discovery into use, we shall soon know more about it.

Messrs. Editors :—I am authorised to announce the discovery and practical test of the most important scientific invention ever yet produced or brought to light since the world has been inhabited by man—an invention which must eventually, and almost immediately, produce an immense revolution in the commercial intercourse and business in general throughout the world; and, although it will break down and ruin many of the most important branches of business and avenues of wealth, with hundreds of wealthy corporations and business establishments, yet it will build up thousands of others, and contribute hundreds of millions to the benefit of mankind, especially to the American community.

The first and main feature and foundation of this invention, and which at once opens a field for hundreds of other inventions, is the discovery of Henry M. Paine, Esq., of a ready and almost expenseless mode of decomposing water and reducing it to the gaseous state. By the simple operation of a very small machine, without galvanic batteries, or the consumption of metals or acids, and only the application of less than one three hundreth (1·300) part of one horse power, Mr. Paine produces 200 cubic feet of hydrogen gas, anp 100 feet of oxygen gas per hour. This quantity of these gases—the actual cost of which is less than one cent—will fur-

nish as much heat by combustion as 2,000 feet of the ordinary coal gas, and sufficient to supply light equal to three hundred common lamps for ten hours; or to warm an ordinary dwelling house twelve hours, including the requisite heat for the kitchen; or to supply the requisite heat for one horse power of steam. This invention has been tested by six months' operation, applied to the lighting of houses, and recently the applicability of these gases to the warming of houses has also been tested with perfectly satisfactory results. A steam engine furnace and a parlor stove, both adapted to the burning of these gases, have been invented, and measures taken for securing patents thereof.

Mr. Paine has one of his machines, new and elgant, now in full operation, and publicly exhibiting and may be expected to exhibit the same in this city within twenty days. The only actual expense of warming houses by this apparatus is that of winding up a weight (like the winding up of a clock) once a day; and the heat produced may be as easily graduated and regulated as the flame of a common gas burner. No smoke whatever is produced, but a very small quantity of steam, sufficient to supply the requisite moisture to the atmosphere. In its application to the production of steam power, it will reduce the expense thereof to the mere wear of machinery, and will immediately produce an immense demand for steam engines, and induce the establishment of thousands of manufacturing mills, reduce the expense of travelling, and increase the demand for agricultural produce, while it ruins the coal and gas business, and such manufacturing establishments as depend on monopoly and high prices. This invention, moreover, removes completely the only obstacles which have hitherto existed in ærial navigation—the difficulty of procuring hydrogen gas, and carrying a supply of fuel; and it may now be considered a matter of tolerable certainty that men will be seen swiftly and safely soaring in various directions before the first of May next. These facts, being of immense importance, should not longer be withheld; and I therefore would avail myself of your widely circulating journal to present them to the public.

Yours respectfully,

R. PORTER.

Washington, Dec. 22, 1849.

Great American Mechanical Work.

D. APPLETON & CO. PUBLISH This Week, No. 1, with numerous illustrations, price 25 cts. A DICTIONARY OF MACHINES, MECHANICS, ENGINE WORK AND ENGINEERING; designed for practical working men, and those intended for the engineering profession. Edited by Oliver Byrne. To be completed in about 40 Nos. Price 25 cents each.

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This volume will be of royal 8vo. size, containing nearly 2,000 pages, 1500 plates, and 6,000 cuts; it will fill up a chasm that has long been a requirement to practical working men, and those intended for the engineering profession. It will present Working Drawings and descriptions of every important machine in practical use in the United States, and independent of its American value as embracing the results of American ingenuity, it will contain a complete treatise on Mechanics, Machinery, Engine work, and the substance of at least a thousand dollars worth of books scattered in expensive folio volumes or magazines.

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No. 2 will be published next week, containing 176 plates.

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ISAAC FRYER, Sec'y.

January 19, 1850. 1y

BALL & CO'S PATENT Indestructible Water Pipe.

We publish below the opinions of others who have a personal knowledge of our Pipe, and would request all persons interested in the conveyance of water to investigate its merits for themselves. It being cheaper than Cast iron pipes, and incomparably more durable (as there is no chance to commence decay but continually grows more permanent) it must supersede it altogether in works requiring durability and purity.—Branching, taping, altering or relaying, is done with the greatest facility, and certainty, without injury, in any size of bore from 3 feet diameter down to ⅛ths of an inch under any head that can be controlled with hose or sewer pipes. J. BALL & CO.

Corner of Read and Centre Sts., N. Y.

FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits:

"In answer to the numerous inquires in relation to J. Ball & Co's Indestructible Water pipe, composed of iron and cement and in use in our village, the undersigned, water commissioners, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6½ to 1½ in. in diameter, under a head of about 80 feet. It has been laid since the fall of 1846. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson, R. Putnam, N. B. Doe, } Water Com.
R. Gardner, H. P. Hyde, J. L. Perry, J. D. Briggs, } Trustees.
S. Chapman, J. A. Corey, W. S. Alger, Wm. Cook, } Late Trustees.

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

"S. R. OSTRANDER, Civil Engineer."

A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gentlemen, I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village, that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipe is far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensible if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water. F. S. CLAXTON,

Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.

Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

Starr & Alburts, 122 Nassau st.
Frederick Marquand, per H. G. M., Atty.
Janes, Beebe & Co.
H. W. Metcalf, 63 and 65 Centre st.
Norman White, 111 Fulton st.
John J. Merritt, No. 76 Columbia st. Brooklyn.
Platt & Brother, 20 Maiden Lane.
Geo. Griswold, South st.
J. & J. W. Meeks, 14, 16 and 18 Vesey st.
Wm. Gale, 116 Fulton st.
J. C. Brown, Builder, 10 Dutch st.
Wm. Colgate & Co.
Thos. C. Smith.
O. R. Burnham, 17 and 19 Broadway.
G. B. Hartson, 58 and 60 Vesey st.
Wm. W. Campbell, 77 St. Mark's Place.
Lorin Brooks, 240 Broadway.

Messrs. J. Ball & Co.:

Gents.: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medicine purposes is all important, and should be considered so for drinking and other uses.

Yours, SAML. MEEKER.

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,
New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust, and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats. Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
President of the Newcastle Manuf. Co.

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THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS,
of various sizes, power and price, constantly on hand at the manufactory.

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PART I, MEDIUM FOLIO OF SPECIMENS OF THE STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States RAILROADS, Illustrated by a Series of DRAWINGS, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards ecomomy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., of the several structures: and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY GEORGE DUGGAN,
ARCHITECT AND CIVIL ENGINEER.

New York: D. Appleton & Co.; John Wiley; Geo. P. Putnam; and Stringer & Townsend. Boston: Charles C. Little and James Brown. Albany: Little & Co. Philadelphia: George S. Appleton; Grigg, Elliott & Co., and Thomas Cowperthwait. Buffalo: G. H. Derby & Co. Baltimore: Cushing & Brother. Washington: Frank Taylor. Charleston: McCarter & Allen. Cincinnati: H. W. Derby & Co., and Bradley & Anthony. Richmond: A. Morris, Nashville: W. T. Berry & Co. New Orleans: T. L. White and David Felt & Co. St. Louis: J. Halsall. Natchez: W. H. Fox.

ADDRESS.

The want of a work such as the present is designed to be, has long been felt and regretted by the Engineering profession generally, but more especially by those engaged in Railroad constructions; where the number and variety of bridges are such as to make the mode of construction adopted of especial importance to all parties interested in such undertakings, whether the mechanical skill, durability, or economy of these structures is considered. As regards the present undertaking, no pains or expense shall be spared to render it complete and efficient to the fullest extent for the various purposes of the Engineer, practical Bridge Builder, and Mechanical Student.

As an extensive circulation alone can meet the heavy expenses incurred in getting up this work, it is hoped that the members of the Engineering profession generally—for whose advantage it is especially designed—will extend to it the encouragement and support so necessary to its secess and completion, in a manner that shall reflect credit on the spirit of enterprise, at present so rife in this great country, and also bear testimony to the mechanical skill and ingenuity of our Engineers.

MODE OF PUBLICATION, TERMS, ETC.

The First or American Division of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

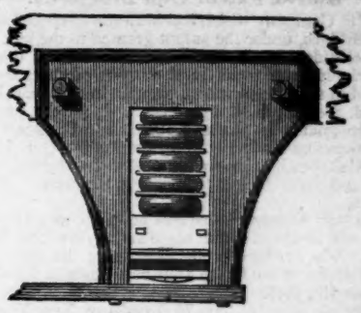
The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

It shall be optional with Subscribers to take the FIRST DIVISION of the work only, but the APPENDIX cannot be supplied to those who do not subscribe for the FIRST DIVISION.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting $9, the cost of First or AMERICAN DIVISION of the work, shall receive it monthly as published, POST FREE, in any part of the United States.

☞ *Engineers in charge of Railroad Works, are respectfully requested to send Tracings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to GEORGE DUGGAN at his residence No. 179 Henry Street, New York, with a view to their insertion in this work. The Drawings should not, however, exceed 17 x 10, or 21 x 17 inches.*

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability.—Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'Rae had seen your springs (as I believe) and entertain it still." WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."
SAM'L H. P. LEE, JR.,
Sup't and Engineer.

Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is *very much superior* to Ray's.
W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost	$190·77	and weigh	2355 lbs.
The same with Fuller's Springs, . . .	131·71	"	1911 lbs.
Difference, . .	$59·06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

Wanted,

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address

VIRGIL D. PANIS,
President Buckfield Branch Railroad,
Portland, Maine.
November 10, 1849. 3t45

The New York Iron Bridge Co.

LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same.

August 4th, 1849. M. M. White, Agent,
au7tf No. 74 Broadway, New York.

To Contractors.

BLUE RIDGE TUNNEL.—The Contractor for the BLUE RIDGE TUNNEL, having failed to come forward and comply with his engagements, notice is hereby given that PROPOSALS will again be received at the Office of the Board of Public Works, until the 21st of January, 1850, for the construction of the Tunnel and approaches.

The Tunnel will be 4260 feet long, 21 feet high and 16 feet wide, with a ditch on each side; it will pass 700 feet under the top of the Mountain and decline from West to East at the rate of 70 feet to the mile. The approaches will be in the aggregate about 2000 feet long, and consist of deep cuts, high embankments, some walling and bridging.

Proposers who have not already examined the localities will do well to call at the office of the Engineer, on the spot, where they will obtain all necessary information.

The payments will be CASH, with a reservation of 20 per cent till the entire completion of the work; besides which, the contractor is required by law to give bond, with satisfactory bond and security in Virginia. The amount of the bond required will be thirty thousand dollars.

The best testimoniais and an energetic prosecution of the work are expected: the contract and bond to be executed within *ten days* after the letting, and the work to begin *bona fide* within sixty days after the same period.

C. CROZET.
Engineer Blue Ridge Railroad.

Terms of proposals and specifications may be obtained at both offices.

NOTICE TO

Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.
34tf

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,
Prest. Beaver Meadow Railroad & Coal Co.,
Philadelphia.
or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.

May 19, 1849. 20tf

ENGINEERS.

Arrowsmith, A. T.,
Buckfield Branch Railroad, Buckfield, Me.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W, H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.
Southwestern Railroad, Macon, Ga.

Higgins, B.
Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Sours, Peter,
Dauphin und Susquehanna Coal Co., Dauphin, Pa.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,
Central Railroad, Savannah, Ga.

Roebling, John A.,
Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,
Androscggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukie, Wisconsin.

Wormeley, Preble,
Central Ohio Railroad, Zanesville, Ohio.

BUSINESS CARDS.

Cumberland, (Md.,) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,
Broker in Scotch and American Pig Iron; Bar Iron, Lead, Spelter, Tin, Copper, etc.,
NO. 4 LIBERTY PLACE, MAIDEN LANE,
(Near Broadway,)
NEW YORK

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

Manufacture of Patent Wire ROPE AND CABLES,
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Samuel D. Willmott,
MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
IMPORTER OF THE
GENUINE WICKESRLY GRINDSTONES,
NO. 8 LIBERTY STREET,
NEW YORK.

Doremus & Harris,
ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.
☞SCHOOL OF CHEMISTRY.☜

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.
Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED —'Potomac' and other good brands of Pig Iron.

Railroad Car Manufacturer's Furnishing Store.

F. S. & S. A. MARTINE,

IMPORTERS AND MANUFACTURERS OF

RAIL ROAD CAR & CARRIAGE LININGS,

PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Moreens, Rattinetts, Cloths, Silk and Cotton Velvets, English Buntings

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND ATTORNEY for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Starks & Pruyn,

MANUFACTURERS OF ALL KINDS OF

STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, Wm. F. Pruyn, ALBANY. Special Partner R. H. Pruyn.

Iron Railing, Bank and Vault Doors, Iron Shutters Bridge and Roof Bolts, Heavy Jobbing and Forging of all kinds.

☞ For particularss ee Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Samuel Kimber & Co.,

COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, *Civil Engineer*,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—

SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.

May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has constantly for sale Steam Engines, Boilers, Lathes, Chucks, Drills, Planers, Force and Suction Pumps; Tenoning, Morticing and Boring Machines, Shingle Machines, Bolt and Nut Machines, Belting, Oil, Iron and Lead Pipe; Rubber, Percha and Leather Hose, &c., &c.

S. C. H.'s arrangements with several machine shops are such that he can supply, at very short notice, large quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.

Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry,

THOMAS & COLLINS,
130 Quay Street, Albany.

To Railroad & Navigation Cos.

MR. M. BUTT HEWSON, *Civil Engineer*, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.

Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steam boat and Stationary Engines, constantly an hand and for sale by

KENNEDY & GELSTON,
5½ Pine St., New York.

October 27, 1849, 3m

IRON.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns' for sale by

COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.

DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal yard, for sale by

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849. 1m46

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

1600 Tons, weighing 60½ lbs. per yard.
185 " " 57½ "
580 " " 53 "

of the latest and most approved patterns. For sale by

BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.

THE Undersigned have on hand, ready for immediate delivery, various patterns of Iron Rails, of best English make, and manufactured in conformity with special specifications.

They offer also to import and contract to deliver ahead—on favorable terms.

DAVIS, BROOKS, & CO.,
68 Broad street.

New York, Oct. 11, 1849.

☞ Drawings and Patterns of the most approved Rail—and specifications of quality and make of same, are on hand at their office, for examination of parties who may desire to inspect the same. D., B. & Co.

Oct. 11, 1849.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by

FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by

GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, *Agent.*
Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Merritt & Co., New York; E. Pratt & Brother, Baltimore Md

LAP—WELDED

WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers

THOMAS PROSSER,
Patentee.
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,
22 South William street,
February 3, 1849. New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, *President*
Troy, N.Y.
ERASTUS CORNING, Albany.
WARREN DELANO, Jr., N.Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phœnix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehannah river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.,
45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

☞Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

☞ Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300	Tons	A 1,	Iron Dale	Foundry Iron.
100	"	1,	"	"
100	"	2,	"	"
100	"	"	Forge	"
400	"	Wilkesbarre	"	"
100	"	"Roaring Run"	Foundry	Iron.
300	"	Fort	"	"
50	"	Catoctin	"	"
250	"	Chikiswalungo	"	"
50	"	"Columbia" "chilling" iron, a very superior article for car wheels.		
75	"	"Columbia" refined boiler blooms.		
30	"	1 x ¼ Slit iron.		
50	"	Best Penna. boiler iron.		
50	"	"Puddled"	"	
50	"	Bagnall & Sons refined bar iron.		
50	"	Common bar iron.		

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale, *Hot Blast* Charcoal *Pig Iron* made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces; Cold Blast* Charcoal Pig Iron from the *Cloverdale* and *Catawba*, Va., Furnaces, suitable for *Wheels* or *Machinery* requiring *extra* strength; also *Boiler* and *Flue Iron* from the mills of Edge & Hilles in Delaware, and *best quality Boiler Blooms* made from *Cold Blast Pig Iron* at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and *Rolled* and *Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1¼ to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, *Patentee.*

☞ These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, *Agents.*
October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE Subscribers are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150	tons	No. 1 Boonton Foundry	Pig Iron.
100	"	No. 2 do.	do.
300	"	Nos. 2 & 3 Forge do.	do.
100	"	No. 2 Glendon do.	do.
140	"	Nos. 2 & 3 Lehigh Crane do	do.
100	"	No. 1 Pompton Charcoal	do.
100	"	New-Jersey Blooms	
50	"	New-Jersey Faggoting Iron, for shafts	

Best Bars, ¼ to 4 inch by ¼ to 1 inch thick.
Do do Rounds and Squares, ⅜ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, ⅜ to 1 in. Ovals & Half Ovals ½ to 1½ in.
Bands, 1½ to 4 inch. Hoops, ⅜ to 2 inch.
Trunk Hoops, ⅜ to 1½ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—
Curtus & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1¼ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address J. F. WINSLOW, *Agent,*
Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, *at less than half its cost*, the following *new machinery*, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

2 Wrought Iron Cranks, 60 inches from centre to centre.
1 Do. do. Connecting Rod Strap.
2 Do. do. Crank Pins.
1 Eccentric Strap.
1 Diagonal Link with Brasses.
1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for *Locomotive Engines* of every size and pattern—also *Tenders, Wheels, Axles*, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC.,
Of any required size or pattern, arranged for driving *Cotton, Woollen, or other Mills*, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY,
Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,
Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.
Turning Lathes, Slabbing, Plaining, Cutting and *Drilling Machines*, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fishkill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, *Agent.*

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and *Other Individuals* and *Associations*, who have constructed or used Bridges involving the combined principle of *Bracing, Counter-bracing* and *Trussing* by means of counteracting braces, keys, wedges, screws, etc., as tet forth and explained in my Bridge Patent of 1830, in the words following, to wit: "*A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded*"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, snd that an amicable adjustment and settlement of all my claims in the primeses may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.
Louisville, December 10, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and *warranted to perform well.* Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price $1,500.

Address J. B. MOORHEAD,
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent—Hose* from 1 to 12 inches diameter. Suction Hose. *Steam Packing*—from 1-16 to 2 in. thick. *Rubber and Gutta Percha Bands.* These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

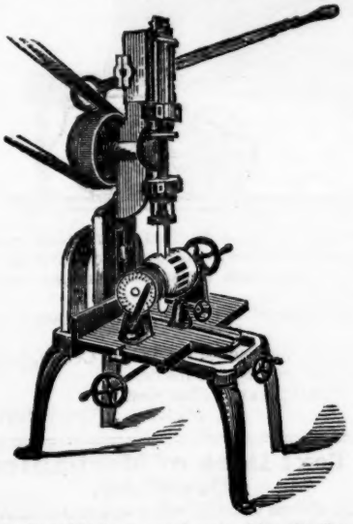
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

Capt. Alfred Swingle's PATENT BORING & MORTISING MACHINE.



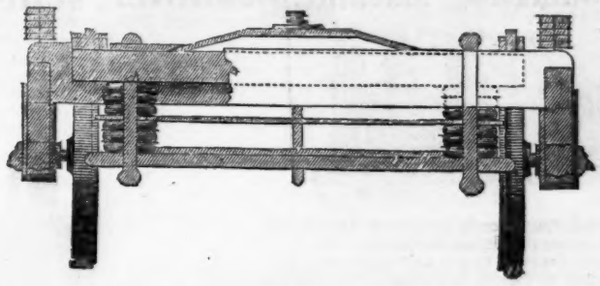
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TEBBETTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorised to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alledges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are G. M. KNEVITT, 38 Broadway, N. York, General Agent for the U. S.: and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,
Makers of
STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA,

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;
Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with
(BIRKINBINE'S PATENT VALVES.)
B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,

NO. 14 OLD YORK ROAD, PHILADELPHIA.
Importer and manufacturer of

New Castle, Nova Scotia, Wickersly	Grindstones, of all sizes and grits.
French Burr, Cocaheo, Cologne	Millstones, made to order, with all the recent improvements.
American and Patent compressed, Garnkirk	Fire Bricks and Tiles of various sizes.

Burr Blocks, Bolting Cloths, Mill Irons, etc.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

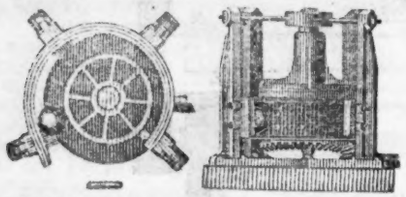
Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Pœnixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has give universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery *for making Spikes*, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNdersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNdersigned, the *Original Inventor* of the *Plate Wheel* with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

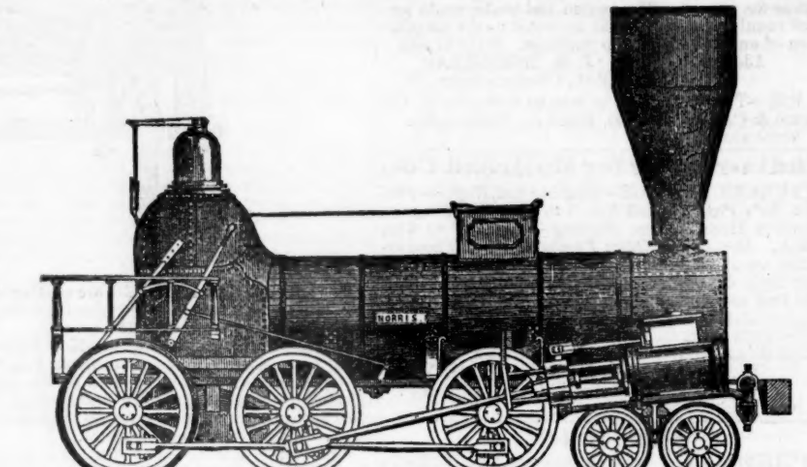
A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country. A. T.

Kensington, Philadelphia Co.,
March 12, 1848.

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tires are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by JOHN W. LAWRENCE,
142 Front-street, New York.

☞ Orders for the above will be received and promptly attended to at this office. 32 1y.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest. P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

Text Book of Mechanical Drawing,

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the *parallel ruler*, *plane scales* and *protractor*.

2d. Examples for drawing *plans*, *sections* and *elevations* of Buildings and Machinery, the mode of drawing elevations from *circular* and *polygonal* plans, and the drawing of Roman and Grecian Mouldings.

3d. An introduction to *Isometrical drawing*, with 4 plates of examples.

4th. A treatise on *Linear Perspective*, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows.

The whole illustrated with 50 STEEL PLATES.

Published by WM. MINIFIE & CO.,
114 Baltimore St., Baltimore Md.

Price $3, to be had of all the principal booksellers.

MR. HALE:—"The New England Car Co., having been engaged for the last six months in introducing the Vulcanized India-rubber Car Spaings upon the different railroads in this and other states, and having in particular introduced it upon the Boston and Worcester railroad with perfect success, were much gratified to find, by your paper of this morning, that the article had given satisfaction to the president of that corporation, and the terms of just commendation in which you were pleased to speak of it. But their gratification was scarcely equalled by their surprise, when, or arriving at the close of your paragraph, they found the results of all their labors attributed to a foreign source, with which the New England Car Co. has no connection. The material used on the Boston and Worcester railroad, and all the other railroads in this country, where any preparation of India-rubber has been successfully applied, is entirely an American invention, patented in the year 1844 to Charles Goodyear, of New Haven, Conn., and the application of it to this purpose and the form in which it is applied are the invention of F. M. Ray of New York. The only material now in use, and so far as has yet appeared, the only preparation of India rubber capable of answering the purpose, has been furnished under these patents by the New England Car Company, manufactured under the immediate inspection of their own agent. If any other should be produced, the right to use it would depend upon the question of its interference with Mr. Goodyear's patent. The New England Car Company have their place of business in this city at No. 99 State street, and are prepared to answer all orders for the Vulcanised India rubber Car Springs, of the same quality and of the same manufacture as those which they have already placed on your road, and most fo the other roads terminating in this city."

And yet Mr. Knevitt is using these experiments made upon the Springs of the Car Company to induce the public to purchase his springs, and is attempting to impose upon them the belief that the springs used were furnished by him! We ask whether such a course is honorable, or entitles his statements to much consideration from the public.

The above Springs are for sale 98 Broadway, New York, and 99 State street, Boston.

EDWARD CRANE Agent, Boston.
F. M. RAY, Agent, New York.

Boston, May 8, 1849.

NICOLL'S PATENT SAFETY SWITCH FOR Railroad Turnouts. This invention for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design. It acts independently of the main track rails; being laid down or removed without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two castings and two rails; the latter, even if much worn or used, not objectionable.

Working models of the Safety Switch may be seen at Messrs. Davenport, Bridges & Kirk's Cambridge Port, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained, on application to the Subscriber, Inventor and Patentee.

G. A. NICOLLS,
Reading, Pa.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.

August, 16, 1849. 6m33

NORRIS' LOCOMOTIVE WORKS, SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Tucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

E. S. NORRIS.

April 11, 1849.

EASTERN RAILROAD.

WINTER ARRANGEMENT.

On and after Monday, October 8, 1849, trains leave Boston daily (Sundays excepted);

For Lynn, 7, 8½, 10 a.m., 12½, 2½, 4, 4½, 6½, p.m.
Salem, 7, 8½ 10, a.m., 12½, 2½, 4, 4½, 6½, p.m.
Manchester and Gloucester, 10 a.m., 4 p.m.
Newburyport, 7, a.m., 12½, 2½ 4½, p.m.
Portsmouth, 7, am., 2½, 4½, pm.
Portland, Me., 7, am., 2½, pm.

And for Boston,

From Portland, 8½ am., 4 pm.
Portsmouth, 7, 10½*, am., 6½*, pm.
Newburyport, 7½, 11½*, am., 3½ 7*, pm.
Gloucester, 7½, am., 1½pm.
Manchester, 8 am., 2 pm.,
Lynn, 7½, 8½*, 9½*, 10½ am., 12 55*, 2½* 4½* 8½* pm.
Salem, 7½, 8½*, 9*, 10½ am., 12 40*, 2½* 4½,* 8*, pm.

**Or on their arrival from the East.*

Freight trains each way daily. Office 17 Merchants' Row, Boston.

Feb. 3. JOHN KINSMAN, Superintendent.

BOSTON & LOWELL RAILROAD.

Passenger trains run as follows, viz:

Upper Railroad Trains.

Leave Boston at 7½ a.m., 12 m. and 4½ p.m.
Leave Lowell at 8 a.m., 1 40 m. and 7 p.m.

Accommodation Trains.

Leave Boston at 7 5 and 9½ a.m., 2½, & 6½ p.m.
Leave Lowell at 7 and 10 a.m., 3½, and 6 p.m.

Woburn Branch Trains.

Leave Woburn Centre at 6½, 7½, and 9½, a.m., 1½ 4½ p.m.
Leave Boston at 8½, 11½ a.m., 3, 5½ and 7 p.m.
On Saturdays, an extra train leaves Woburn centre at 9 p.m. and Boston at 10 p.m.

WALDO HIGGINSON,
Agent Boston and Lowell Railroad Cor.

Boston, October 5, 1849. 22tf.

FITCHBURG RAILROAD.

On and after Monday, October 1, 1849, trains will run as follows:—

Express train leaves Boston at 7½ a.m. with passengers for the Vermont and Massachusetts, Cheshire, Rutland, Sullivan, Vermont Central, and Passumpsic Railroads. The Express train will run up without any stops, excepting for wood and water.

Accommodation Up Trains.

For Fitchburg, 6 50 and 11 a.m., 5¾ p.m.
West Townsend, 6 50 and 11 a.m., and 5¾ p.m.
Groton, 6 50 and 11 a.m., 5¾ p.m.
Concord, 6 50 and 11 a.m., 5¾ and 6½ p.m.
Waltham, 6 50, 8, 10, 11 a.m., 1½, 4¾, 5¾, 6½ p.m.
Fresh Pond, Mount Auburn and Watertown, 7 5 and 10½ a.m., 12 m., 2 20, 4½ and 6¾ p.m.
West Cambridge and Lexington, 8½ a.m., 2½, & 5¾ p.m.

Down Trains.

From Fitchburg, 7 50 a.m., 12 m., 1 17 and 6¾ p.m.
West Townsend, 7½ a.m., 12 m., and 6¾ p.m.
Groton, 8 20 a.m., 12½, 1 47 and 7 20 p.m.
Concord, 6 50, 9 a.m., 1 12, 2 25 and 7 55 p.m.
Waltham, 7½, 8 50, 9 25 and 11 a.m., 1 35, 2 50, 4, 5 45, and 8 22 p.m.
West Cambridge and Lexington, 7½ & 10 a.m., and 4½ p.m.
Fresh Pond, Mount Auburn and Watertown, 6½, 8 and 11 a.m., 1½, 3½ and 6 p.m.

S. M. FELTON, Sup't.

Boston, October 1, 1849.

ALBANY AND BUFFALO RAILROADS.—Four Trains daily, Sundays excepted, viz: Leave Albany, 6 a.m., 9 a.m., 2 p.m., 7 p.m. Reach Buffalo, 15 hours, 18 hours, 23 hours, 18 hours. Arrive from Buffalo, 7 p.m., 2½ a.m., 12¼ m., 3½ p.m.

Passengers by the *Express Train* reach Buffalo from New York, and New York from Buffalo, in 24 hours. The Isaac Newton and Oregon connect at Albany with this Train. Baggage cars, with careful baggage masters, run through with all the trains.

For Schenectady, Saratoga Springs & Whitehall,

Leave Albany at 7 a.m. and 2 p.m. For Schenectady only at 6, 7 and 9 a.m. and 12½, 2 and 7 p.m. For Erie Canal packets at 7 a.m. and 7 p.m. By Plank Road from Schenectady to Saratoga at all hours by stages, etc.

The *Eastern Trains* leave Albany at 7 a.m. and 3 p.m. The wagons of the company take baggage *free* between railroads and steamboats at Albany.

E. FOSTER, Jr., Sec'y
Albany and Schenectady Railroad Co.

Albany, August, 1849.

BOSTON AND MAINE RAILROAD.

Winter Arrangement, 1850.

Outward Trains from Boston

For Portland at 7 am. and 2½ pm.
For Rochester at 7 am., 2½ pm.
For Great Falls at 7 am., 2½, 3½ pm.
For Haverhill at 7 and 9½ am., 2½, 3½, 5½, pm.
For Lawrence 7, 7½, 9½ am., 12m. 2½, 3½, 4½ 5½, pm.
For Reading 7, 9½ am., 12m. 2½, 3½, 4½, 5½, 7½, 9½ pm.
For Medford 7½, 9½ a.m., 12½, 2½, 5, 6½, 9½ p.m.
The Station in Boston is on Haymarket Square.

CHAS. MINOT, Super't.

January 10, 1850.

NEW YORK AND HARLEM RAILROAD.

NEW ARRANGEMENT.

On and after Wednesday, October 17th, 1849, the Cars will run as follows, (Sundays excepted) until further notice:

Trains will leave the City Hall, New York, for—

Harlem and Morrisania at 6½, 8, 10, 11, 12 am., 2, 3½, 4, 5, 6½ pm.
New Village, at 8½, 10, 12 am., 3½, 5, 6½ pm.
Fordham and Williams' Bridge, at 8½, 10, 12 am., 2½ 3½, 5, 6½ pm.
Hunt's Bridge, Underhill's and Hart's Corners, at 8½, 10 am., 3½, 5 pm.
Tuckahoe and White Plains, at 8½, 10 am., 2½, 3½, 5 pm.
Pleasantville, New Castle, Bedford, Mechanicsville, Purdy's, Croton Falls, and intermediate stations, on signal, 8½ am., 2½, 3½ pm.
Brewster's, Towner's, Patterson, Paulding's, South Dover, Dover Furnace, and Dover Plains, 8½ am., 2½ pm.

NOTICE—Passengers are reminded of the great danger of standing upon the platform of the cars, and hereby notified that the practice is contrary to the rules of the Company, and that they do not admit any responsibility for injury sustained by any passenger upon the platforms, in case of accident.

Returning to New York will leave

Harlem and Morrisiana at 6 08, 7½, 8 37, 9, 10 6, 12 am., 1 43, 3 07, 3½, 5, 5 47 pm.
New Village, at 5 58, 8 27, 9 56 am., 1 33, 2 57, 5 36 pm.
Fordham and William's Bridge at 5½, 8 14, 9 43, 10 57 am., 1 20, 2 44, 5 24 pm.
Hunt's Bridge at 8 04, 9 33 am., 2 34, 5 16 pm. On signal.
Underhill's, at 7 56, 9 23 a.m., 2 26, 5 10 p.m. On signal.
Tuckahoe at 7 53, 9 18, 10 40 am., 2 23, 5 08 pm.
Hart's Corners at 7 38, 9 03 am., 2 08, 4 54 pm.—On signal.
White Plains at 7½, 8 55, 10 20 am., 2, 4 47 pm.
Davis' Brook at 8 40, 10 11 am., On signal. 4 39 pm. On signal.
Unionville, 8 27, 10 11 am. On signal. 4 29 pm.—On signal.
Pleasantville at 8 20, 9 56 am., 4 24 pm.
Champaqua, at 8 10, 9 50 am. On signal. 4 18 pm. On signal,
New Castle, at 7 56, 9 38 am.. 4 07 pm.
Bedford at 7 46, 9 32 am., 4 02 pm.
Mechanicsville at 7 36, 9 22 am., 3 52 pm.
Golden's Bridge, 7 28, 9 17 am. On signal, 3 47 p m. On signal.
Purdy's at 7 20, 9 09 am., 3 39 pm.
Croton Falls, at 7½, 9 04 am.,3 34 pm.
Brewster's, at 8 50 am., 3 20 pm.
Towner's, at 8 35 am., 3 05 pm.
Paterson, at 8 27 am., 2 57 pm.
Paulding's, at 8 17 am., 2 47 pm.
South Dover, 8 02 am., 2 32 pm.
Dover Furnace, 7 55 am., 2 25 pm.
Dover Plains, at 7 45 am., 2 15 pm.

The trains for Harlem and Morrisiana leaving City Hall at 6½, 8, 10, 11, 12, 2, 4 and 6½, returning from Morrisiana and Harlem at 6 08, 7½, 9, 12, 1 43, 3 07, 3½ and 5 o'clock, will land and receive passengers at 27th 42d, 51st, 61st, 79th, 86th, 109th, 115th, 125th and 132d streets.

The Dover Plains train from New York at 2½ pm., returning leaving Dover Plains at 7½ am., will not stop between White Plains and New York, (except at Tuckahoe, Williams' Bridge and Fordham,) unless to leave passengers coming from above Croton Falls.

A car will precede each train ten minutes to take up passengers in the city. The last car will not stop, except at Broome st. and 27th street.

Freight Trains leave New York at 1 o'clock pm.—Returning, leaves Dover Plains at 12 o'clock m.

For Sunday Aarrangements, see hand bills.

M. SLOAT, Sup't.

NEW YORK AND ERIE RAILROAD. OPEN TO ELMIRA.

On and after the 8th of October, the trains will run as follows, (Sundays excepted):

THROUGH PASSENGER TRAINS from New York to Elmira, will leave the Company's Pier at the foot of Duane street, at 7 o'clock a.m. and 5 o'clock p.m. stopping at all the way stations.

From Elmira the through trains will leave for New York at 5 o'clock a.m. and 6½ p. m., stopping also at all the way stations.

A SPECIAL WAY TRAIN, for Port Jervis and intermediate stations, except Sufferns, will leave New York every Saturday at 3 p. m., and will leave Port Jervis for New York every Monday morning, at 4 55 o'clock.

A MILK TRAIN, with Passenger Cars attached, will leave Port Jervis for New York at 3 o'clock a.m. and returning will leave New York for Port Jervis at 3 p.m. Another milk train with passenger car, will leave Piermont for Otisville at 9 am., and returning leave Otisville at 4 55 p.m., connecting with the freight boats to New York. The milk trains do not connect with the P. and R. railroad.

FREIGHT.—Freight leaves New York every night for all the regular stations on the road. A freight train will leave Elmira every morning at 3 20 o'clock a.m. —A freight train will leave Port Jervis for New York every morning at 5 o'clock, and another at 8 a.m. with market freights.

A Special Train for cattle and other live stock, will leave Elmira on Tuesdays and Fridays at 12 20 p.m.; and from Port Jervis, for New York, on Wednesdays and Saturdays, at 8 40 a.m.

FARE from New York to Elmira $5 75. The intermediate stations in proportion.

COMMUTATION TICKETS, at lower rates, for the stations between New York and Port Jervis, can be purchased at the New York and Piermont offices.

The Steamboat ERIE leaves New York for Piermont every day at 3 o'clock, and returns on the arrival of the train from Elmira, arriving at New York at about 7½ p.m.

JAMES P. KIRKWOOD, Superintendant.

GEORGIA RAILROAD. FROM AUGUSTA TO ATLANTA—171 MILES.

AND WESTERN AND ATLANTIC RAILROAD, FROM ATLANTA TO DALTON, 100 MILES.

This Road, in connection with the South Carolina Railroad, and Western and Atlantic Railroad, now forms a continuous line, 408 miles in length, from Charleston to Dalton Cross Plains) in Murray county, Ga. 32 miles from Chattanooga, Tenn.

RATES OF FREIGHT.		Between Augusta and Dalton. 271 miles.	Between Charleston, and Dalton. 408 miles.
1st class	Boxes of Hats, Bonnets, and Furniture, per cubic foot	$0 18	$0 28
2d class	Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs, and Confectionary, per 100 lbs.	1 00	1 50
3d class	Sugar, Coffee, Liquor, Bagging, Rope, Cotton, Yarns Tobacco, Leather, Hides, Copper, Tin, Feathers, Sheet Iron, Hollow ware, Castings, Crockery, etc.	0 60	0 85
4th class	Flour Rice, Bacon, Pork, Beef, Fish, Lard, Tallow, Beeswax, Bar Iron, Ginseng, Mill Gearing, Pig Iron, and Grindstones, etc.	0 40	0 65
	Cotton, per 100 lbs.	0 45	0 70
	Molasses per hogshead	8 50	13 50
	" " barrel	2 50	4 25
	Salt per bushel	0 18	
	Salt per Liverpool sack	0 65	
	Ploughs, Corn Shellers, Cultivators, Straw Cutters, Wheelbarrows	0 75	1 50

German or other emigrants, in lots of 20 or more, will be carried over the above roads at 2 cents per mile.

Goods consigned to S. C. Railroad Company will be forwarded free of commissions. Freights payable at Dalton.

F. C. ARMS,
44*1y Sup't of Transportation.

LITTLE MIAMI RAILROAD.—SUMMER ARRANGEMENT.

CINCINNATI & SANDUSKY.

FIRST Passenger Train leaves Depot on East Front street, at 5 o'clock 10 minutes A. M. stops for breakfast at Morrow, and arrives at Springfield at 11 10 A. M. Leaves Springfield for Sandusky at 11 50 A. M.

Second Passenger Train leaves Depot 3 P. M. arrives at Springfield at 9 P.M. Passengers take tea at Springfield, and leaves for Sandusky at 9¼ P. M.

RETURNING—First Train leaves Springfield at 4 A. M. Stop for breakfast at Xenia, and arrives at Cincinnati at 10 15 A. M.

Second Train leaves Springfield at 2¼ P. M. Stop for tea at Morrow, and arrives at cincinnati, at 8¼ P. M.

Passengers taking the Morning Train arrive at Sandusky at 9 P. M. Those taking the Afternoon Train arrive at 7½ A. M. next morning, and proceed directly on in the boats.

Passengers for columbus, Zanesville, Wheeling, and intermediate towns, should take the 5, 10 A. M., Train.

The Ohi Stage Company are running the following Lines in connection with the Trains:

A Daily Daylight Line to Columbus from Springfield in connection with the Morning Train from Cincinnati. Also, Daily Lines to Columbus, from Xenia and Springfield, connecting with the 3 o'clock, pm. Train from Cincinnati.

Fare from Cincinnati to Xenia			$1 90
Do	do	Springfield	2 50
Do	do	Sandusky City	6 50
Do	do	Buffalo	10 00
Do	do	Columbus	4 50

For other information and through tickets, apply at the Ticket Office on Broadway, near Front-st., Cincinnati.

W. H. CLEMENT, Superintendent.

☞ The Company will not be responsible for Baggage exceeding 50 dollars in value, unless the same is returned to the Conductors or Agent, and freight paid at the rate of a passage for every 500 dollars in value above that amount.

PHILADELPHIA, WILMINGTON, & BALTIMORE RAILROAD.

Summer Arrangement.
April 1st, 1849.—Fare $3.

Leave Philadelphia 8½ am., and 10 pm.
Leave Baltimore 9 am, and 8 pm.
Sunday—Leave Philadelphia at 10 pm.
" " Baltimore at 8 pm.
Trains stop at way stations.

Charleston, S. C.
Through tickets Philadelphia to Charleston, $20.

Pittsburg and Wheeling.
Through ticket, Philadelphia to Pittsburg, $12.
" " Wheeling, 13.
Through tickets sold at Philadelphia office only.

Wilmington Accommodation.
Leave Philadelphia at 12 m. 4 and 7 pm.
Leave Wilmington at 7½ am., 4½ and 7 pm.

Newcastle Line.
Leave Philadelphia at 2½ pm.—Baltimore at 1½ pm
Fare $3.—Second class, $2.
N.B.—Extra baggage charged for.

I. R TRIMBLE, Gen. Supt.

BALTIMORE AND SUSQUEHANNA RAILROAD.—Reduction of Fare. Morning and Afternoon Trains between Baltimore and York.—The Passenger Trains run daily, except Sundays, as follows:

Leave Baltimore at	9 am. and 3½ pm.
Arrive at	9 am. and 6½ pm.
Leave York at	5 am. and 3 pm.
Arrive at	12½ pm. & 8 pm.
Leave York for Columbia at	1½ pm. & 8 am.
Leave Columbia for York at	8 am. & 2 pm.

Fare:

Fare to York	$1 50
" Wrightsville	2 00
" Columbia	2 12½

Way points in proportion.

PITTSBURG, GETTYSBURG, AND HARRISBURG.

Through tickets to Pittsburg via stage to Harrisburg	$9
Or via Lancaster by railroad	10
Through tickets to Harrisbnrg or Gettysburg	3

In connection with the afternoon train at 3½ o'clock, a horse car is run to Green Spring and Owing's Mill, arriving at the Mills at - - 5½ pm.
Returning, leaves Owing's Mills at - - 7 am.

D. C. H. BORDLEY, Sup't.
31 1y Ticket Office, 63 North st.

PHILADELPHIA & READING RAILROAD. Passenger Train Arrangement for 1849.

A Passenger Train will leave Philadelphia and Pottsville daily, except Sundays, at 9 o'clock am.

The Train from Philadelphia arrives at Reading at 12 18 m.

The Train from Pottsville arrives at Reading at 10 43 am.

Fares.	Miles.	No. 1.	No. 2
Between Phila. and Pottsville,	92	$3.50 and	$3.00
" " Reading	58	2.25 and	1.90
" Pottsville "	34	1.40 and	1.20

Five minutes allowed at Reading, and three at other way stations.

Passenger Depot in Philadelphia corner of Broad and Vine streets. 8tf.

BALTIMORE AND OHIO RAILROAD AND WASHINGTON BRANCH.

On and after January 1, 1850, Passenger Trains will run as follows:

Leave Baltimore for Ellicott's Mills, Frederick, Harper's Ferry, Martinsburg, Hancock and Cumberland, every morning at 7½ o'clock. This line carries the Great Mail, and connects with Post Coaches at Cumberland, for Wheeling and Pittsburg, over the National Road. Also with the Winchester Trains, at Harper's Ferry. N.B.—Passengers for Pittsburg take the steamers of the Monongahela slack water navigation at *Brownsville*, only 76 miles from Cumberland.

Leave Baltimore for Ellicott's Mills, Frederick and Harper's Ferry, daily, except Sunday, at 4½ p.m.

Leave Baltimore for Washington City, daily, at 6 a.m. and 5 p.m.—daily, except Sunday, at 9 a.m. The early train connects with the Great Southern Line, via Fredericksburg and Richmond, to Charleston.

Leave Cumberland for Baltimore, etc., at 8½ a. m., daily, connecting with the train from Winchester at Harper's Ferry—with the Evening Train to Washington City, at the Relay House—and with the Evening Train to Philadelphia, at Baltimore. Time for arriving at Baltimore, 5½ p.m.

Leave Harper's Ferry for Baltimore, daily, except Sunday, at 7½ a. m—taking in Passengers who leave Frederick at 8½ a.m.

Leave Washington for Baltimore, daily, at 6 a.m. & 5½ p.m., and *daily, except Sunday*, at 9½ a. m. The early train connects at the Relay House with the morning line to Cumberland and the West, and at Baltimore with the day line to Philadelphia and New York.

Through tickets are sold at *Philadelphia and Baltimore* for Pittsburgh and Wheeling, and at *Philadelphia and New York* for Charleston, S. C., at the following

RATES OF FARE.

	To Pittsburg. In winter.	Summer.	Wheeling. Win.	Sum.	Charleston.
From Philadelphia,	$13	$12	$14	$13	$20
" Baltimore,	11	10	12	11	
" New York,					20

Passengers leaving New York not later than the afternoon line via Newark, etc., reach Baltimore in season to take the next morning's lines to the South and West.

Passengers leaving Cumberland in the morning and Washington in the evening lines, reach Baltimore in season to proceed to Philadelphia by the evening train at 8 p. m.—so as to reach New York before noon the next day.

An Emigrant line by burthen cars, leaves Baltimore every morning, except Sundays, at 4 o'clock—connecting with a line of the previous day from N. York—and at Cumberland with a wagon line to Pittsburg or Brownsville and Wheeling. Fare by this line:

From New York to Pittsburg,	$8 00
" Philadelphia "	6 50
" Baltimore "	5 00

By order, J. T. ENGLAND, Agent.

SOUTH CAROLINA RAILROAD.—A Passenger Train runs daily from Charleston, on the arrival of the boats from Wilmington, N. C., in connection with trains on the Georgia, and Western and Atlantic Railroads—and by stage lines and steamers connects with the Montgomery and West Point, and the Tuscumbia Railroad in N. Alabama.

Fare through from Charleston to Montgomery daily	$26 50
Fare through from Charleston to Huntsville, Decatur and Tuscumbia	22 00

The South Carolina Railroad Co. engage to receive merchandize consigned to their order, and to forward the same to any point on their road; and to the different stations on the Georgia and Western and Atlantic Railroad; and to Montgomery, Ala., by the West Point and Montgomery Railroad.

JOHN KING, Jr., Agent.

AMERICAN RAILROAD JOURNAL.

CENTRAL RAILROAD—FROM SAVANNAH to Macon. Distance 190 miles.

This Road is open for the transportation of Passengers & Freight

Rate of Passage - - $8 00. Freight—
On weight goods generally, 50 cts. per hundred
On measurement goods - 13 cts. per cubic ft.
On brls. wet (except molasses and oil) - - 1 50 per barrel.
On brls. dry (except lime) - 80 cts. per barrel.
On iron in pigs or bars, castings for mills, and unboxed machinery - - - 40 cts. per hundred
On hhds. and pipes of liquor, not over 120 gallons - $5 00 per hhd.
On molasses and oil - $6 00 per hhd.

Goods addressed to F. WINTER, Agent, forwarded free of commission.

THOMAS PURSE,
Gen'l Sup't Transportation.

THE WESTERN AND ATLANTIC RAILROAD.—This Road is now in operation to Oothcaloga, a distance of 80 miles, and connects daily (Sundays excepted) with the Georgia Railroad.

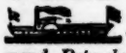
From Kingston, on this road, there is a tri-weekly line of stages, which leave on the arrival of the cars on Tuesday, Thursday and Saturday, for Warrenton, Huntsville, Decatur, and Tuscumbia, Alabama, and Memphis, Tennessee.

On the same days the stages leave Oothcaloga for Chattanooga, Jasper, Murfreesborough, Knoxville and Nashville, Tennessee.

This is the most expeditious route from the east to any of these places.

CHAS. F. M. GARNETT,
Chief Engineer

GREAT NORTHERN & SOUTHERN MAIL ROUTE. From New York to Charleston, S. C.



daily, via *Philadelphia, Baltimore, Washington City, Richmond, Petersburg, Weldon and Wilmington, N. C.*

Travellers by this route, leaving New York at 4½ p. m., Philadelphia at 10 p.m., and Baltimore at 6 a.m., proceed without delay at any point on the route, arriving at Richmond, Va., in a day, and at Charleston, S. C., in two and half days from New York.

Through tickets from New York to Charleston, $20 00
" " Baltimore to Richmond, 7 00
" " " " Petersburg, 7 50

For tickets to Richmond and Petersburg, or further information, apply at the *Southern Ticket Office, adjoining the Washington Railroad Ticket Office, Pratt Street, Baltimore.* STOCKTON & FALLS.

October, 1849.

ST. LAWRENCE & ATLANTIC RAILROAD COMPANY.

Notice is hereby given that the Trains run twice per day between

Montreal and St. Hyacinthe, leaving each terminus alternately, until further notice.

Leaverng St. Hyacinth at - - 7 am.
" " - - 3 pm.
Leaving Montreal at - - - 10 am.
" " - - - 6 pm.

THOMAS STEERS, *Secretary.*

May 31, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by POWERS & WEIGHTMAN, manufacturing Chemists, Philadelphia.

Jan. 20, 1849.

Engine and Car Works,
PORTLAND, MAINE.

THE PORTLAND COMPANY, Incorporated August 8th, 1846, with a capital of $250,000, have erected their extensive Works upon the deep water of Portland Harbor, and receive and transport, to and from their works direct, to and from vessels of any class.

They now manufacture to order, and deliver upon the Railroads running in each direction from the city, or on shipboard as wanted, Locomotive, Stationary, or Steam Boat Engines; Passenger, Mail, Freight, Earth and Hand Cars; Railway Frogs, Switches, Chairs and Castings; and every other description of Machinery. HORACE FELTON,
Superintendent.

JAMES C. CHURCHILL,
General Agent and Clerk.

C. W. Bentley & Co,

IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plowman Sts., near Balttmore St. Bridge,

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupyidg but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fillings for Steam, Water, Gas, etc., constantly on hand,

Baltimore, June 6, 1849.

PHILADELPHIA CAR MANUFACTORY,

CORNER SCHUYLKILL 2D AND HAMILTON STS.,

SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country.

Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.

Philadelphia, June 16, 1849. 1y25

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat *as any that has been or can be made by any person*—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR.,
98 Broadway, opposite Trinity Church.
New York, October, 1849.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad* and *Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.

New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.
St. Johnsbury, Vt.

Agents, { FAIRBANKS & Co., 81 Water St., N. York. / A. B. NORRIS, 196 Market St. Philadelphia.

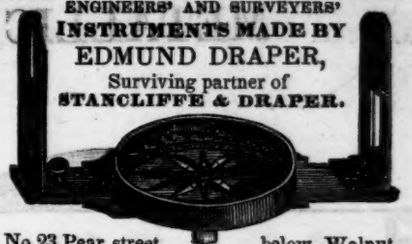
April 22, 1849. 1y*17

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL superior quality for Locomotives, for sale by
H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849. 1m19

ENGINEERS' AND SURVEYERS'
INSTRUMENTS MADE BY
EDMUND DRAPER,
Surviving partner of
STANCLIFFE & DRAPER.



No 23 Pear street, below Walnut,
3 0 near Third, Philadelphia.

CAR MANUFACTORY
CINCINNATI, OHIO.

KECK & DAVENPORT WOULD RESPECTfully call the attention of Railroad Companies in the West and South to their establishment at Cincinnati. Their facilities for manufacturing are extensive, and the means of transportation to different points speedy and economical. They are prepared to execute to order, on short notice, Eight-Wheeled Passenger Cars of the most superior description. Open and Covered Freight Cars, Four or Eight-Wheel Crank and Lever Hand Cars, Trucks, Wheels and Axles, and Railroad Work generally.

Cincinnati, Ohio, Oct. 2, 1848. 44ti

MACHINE WORKS OF ROGERS KETCHUM & GROSVENOR, *Patterson, N. J.* The undersigned receive orders for the following articles manufactured by them of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and dispatch.

Railroad Work.—Locomotive Steam Engines and Tenders; Driving and other Locomotive Wheels, Axles Springs and Flange Tires; Car Wheels of Cast Iron a variety of patterns and chills; Car Wheels of Cast Iron with wrought tires; Axles of best American refined iron; springs; boxes and bolts for cars.

Cotton, Wool and Flax Machinery of all descriptions and of the most improved patterns, style and workmanship.

Mill gearing and millwright work generally, hydraulic and other presses; press screws; callenders; lathes and tools of all kinds; iron and brass castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,
Patterson, N. J., or 60 *Wall St., New York.*

Plumbago, or Black Lead,

BLACK LEAD IN ITS CRUDE STATE, AND Black Lead Paints, prepared for various purposes. This paint is peculiarly adapted for the covering of all kinds of iron railing, or iron work wherever exposed; such as railroad bars, anchors, bolts for vessels, etc.—It makes the most durable paint to protect woodwork from moisture, and the indestructable nature of the body of it peculiarly fits it for covering the inside of depots, roofs of buildings, and all wood work exposed to fire.

The mine from which this article is taken is near Raleigh N. C. It has been examined by many of the most scientific men in this country, who all concur in pronouncing it of the best quality. In the fourth vol. of the American Journal of science, Professor Silliman speaks of it in the following manner. "The Plumbago from North Carolina is of a very fine quality and appears well adapted for pot & crayons." Professor Dewy speaks of it "as the finest he ever saw." Professor Olmstead, now of Yale College in his geological report of the State of North Carolina, Page 5 says.—"Not long since I received a letter from a gentleman in Vermont who contemplated setting up the manufacture of Black Lead Pots or Crucibles, requesting some particulars respecting this Plumbago, having been informed on the highest authority, that it was the best that could be procured within the United States."

It is a very fine article and superior for Pencils also for Crusibles, Pots etc., when the composition of silicious minerals is properly made to suit it, and may be had in any reasonable quantities of the subscriber on liberal terms at Raleigh North Carolina or at James Holdene 55 West St. New York.

Sep., 7th 1849. Richard Smith,

FOWLER M. RAY'S
METALLIC INDIA RUBBER CAR SPRINGS.

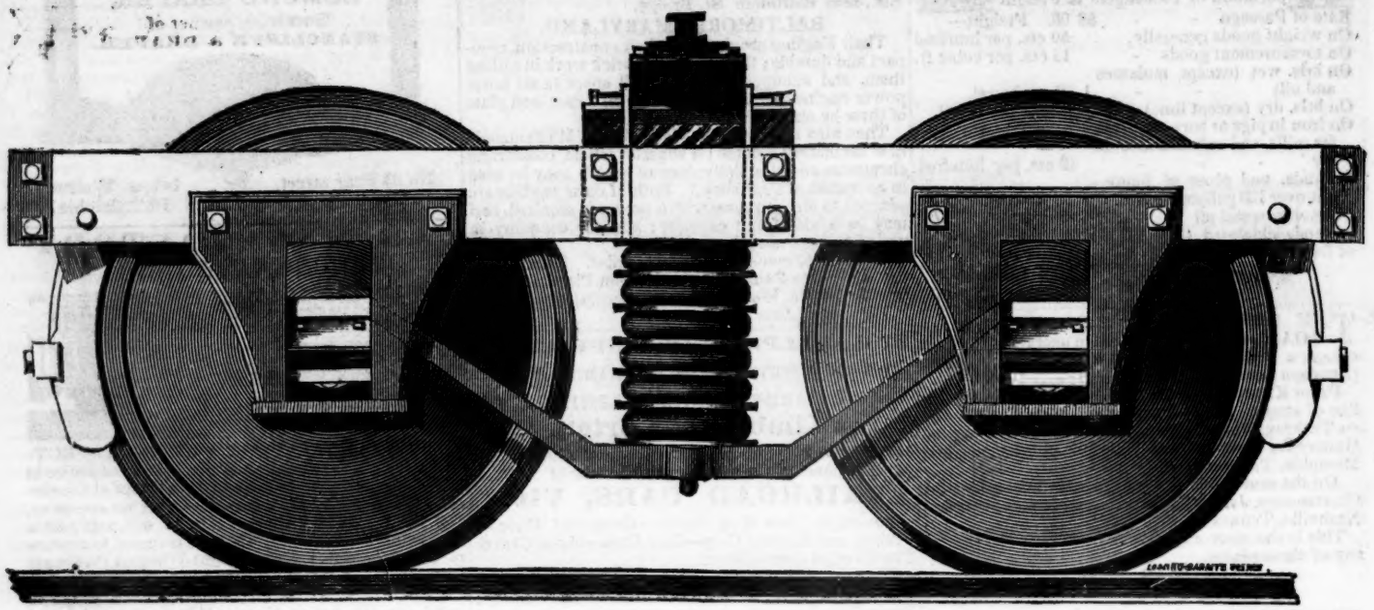


Fig. 1.

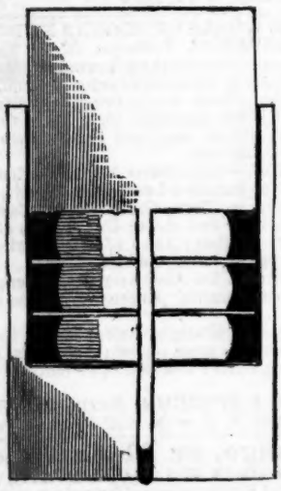


Fig. 2.

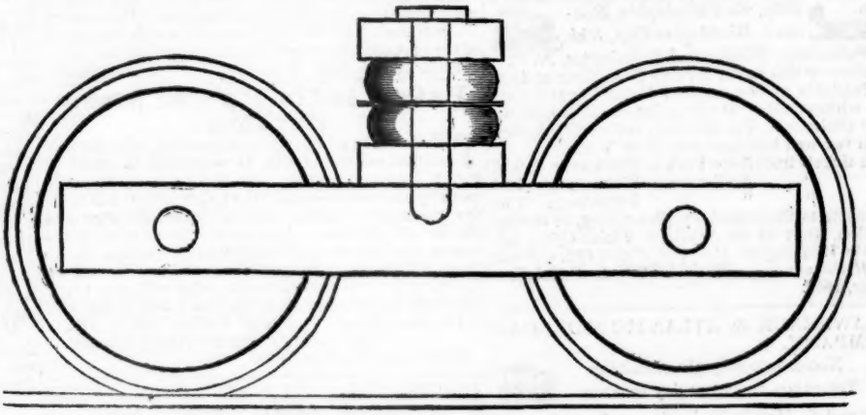
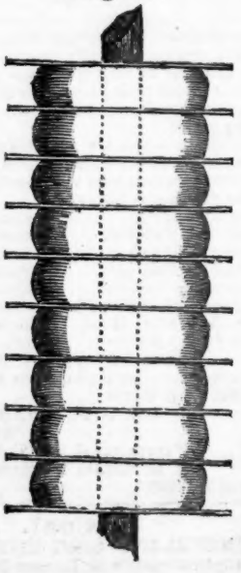


Fig. 3.



So much has been published for the purpose of misleading the public in regard to the inventorship of the India-rubber Railroad Spring, patented in the United States by Mr. W. C. Fuller, that the New England Car Company, proprietors of this invention, have deemed it proper, for the information of Railroad Companies, Car Builders and the public generally, to lay before them the facts upon which they found their claim to this invention, and to a Patent therefor.

Cut No. 1, Represents a cross section of the first model made by Mr. Tucker, under the direction of Mr. Ray, in the summer of 1844, and to which Mr. Tucker, Mr. Bradley and Mr. Bannester testify as being the model marked "B."

Cut No. 2, Represents the model made in 1845, to which Mr. Osgood Bradley and Gen. Thos. W. Harvey have testified.

Cut No. 3, Represents a rough sketch made by Mr. Ray in 1844, which he gave to a man about departing for England to take out some patents, who promised to write to Ray after his arrival in that country—which promise he has probably forgotten.

Mr. W. C. Fuller, of England, patented the above Spring in that country on the 23d October, 1845. He filed his enrollment April 23d, 1846, and on the 22d October, 1846, he took out a patent in the United States under the title, "For Improvement in Railway Carriages," when the improvement consisted in the spring, and not in the carriage.

The reader will perceive by the annexed testimony, that the India-rubber Railroad Car Spring was invented by Mr. Ray about two years previous to the date of Mr. Fuller's enrollment.

The Depositions are omitted for want of room, but will be published in full in the course of a few weeks.

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HENRY V. POOR,
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